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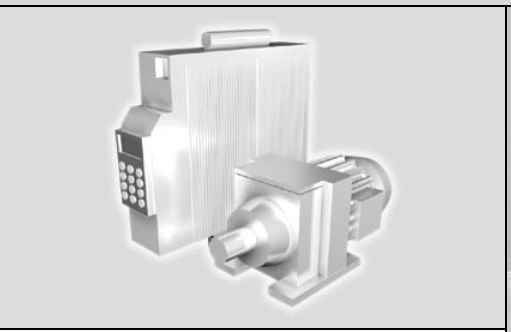
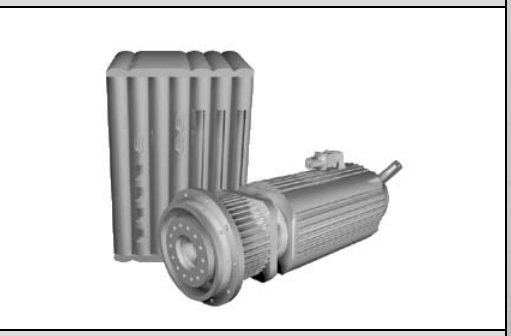
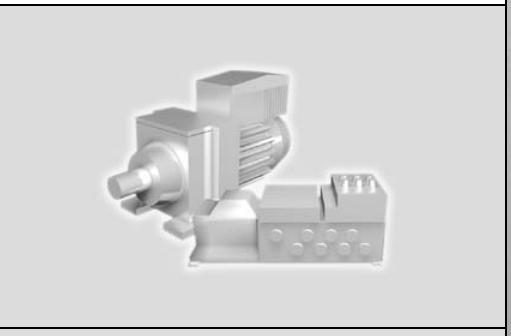
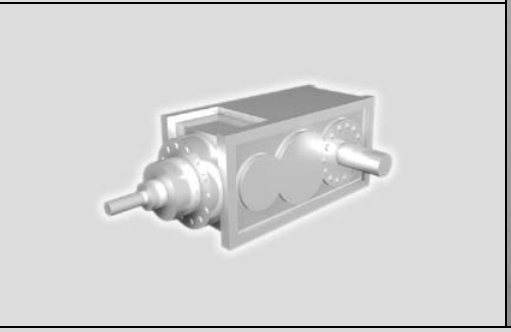








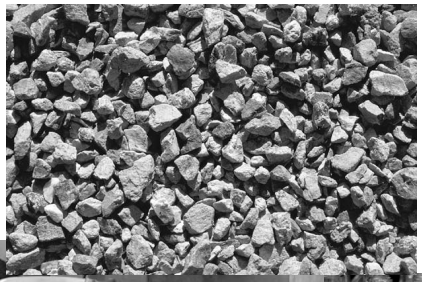
BSF.. Helical-Bevel Servo Gear Units

GB112000

Edition 06/2006

11405015 / EN

Operating Instructions



SEW EURODRIVE

1 Important Information about the Operating Instructions 5
1.1 Important notes and designated use 5
1.1.1 Integral part of the product 5
1.1.2 Designated use 5
1.1.3 Qualified personnel 5
1.1.4 Liability for defects 5
1.1.5 Product names and trademarks 6
1.2 Waste disposal 6
1.3 Explanation of symbols 7

2 Safety Notes 8
2.1 Preliminary information 8
2.2 General information 8
2.3 Shipping / Putting into storage 9
2.4 Installation / assembly 9
2.5 Startup / operation 9
2.6 Inspection and maintenance 10

3 Delivery Scope and Unit Design 11
3.1 Types and options 11
3.2 Unit designation and nameplate 13
3.2.1 Example: Unit designation of BSF.. helical-bevel servo gear units with EBH adapter 13
3.2.2 Nameplate for helical-bevel servo gear units with EBH adapter 14
3.2.3 Example: Unit designation for BSBF.. helical-bevel servo gearmotors 15
3.2.4 Nameplate for helical-bevel servo gear units with direct mounting 16
3.3 Gear unit design 17
3.3.1 Basic design of the helical-bevel servo gear units BSF.., BSHF.. and BSKF.. 17
3.3.2 Basic design of the BSBF.. helical-bevel servo gear units 18
3.3.3 Basic design of an adapter for helical-bevel servo gear units 19

4 Mechanical Installation 20
4.1 Before you start 20
4.2 Prerequisites for installation 20
4.3 Required tools / resources 20
4.4 Installing the gear unit 21
4.5 Installation in the machine 22
4.5.1 BSF.. helical-bevel servo gear unit: Mounting at gear unit end via the B5 mounting flange 22
4.5.2 BSBF..B helical-bevel servo gear unit: Mounting at the foot end 22
4.5.3 BSBF..B helical-bevel servo gear unit: Mounting at the front end 23
4.6 Activating the breather valve 24
4.7 Mounting output elements on solid shafts 25
4.7.1 Assembly with key 25
4.7.2 Assembly without key 26
4.7.3 Avoiding impermissibly high overhung loads 27
4.7.4 Inner and outer centering rings for flange block gear units 27
4.7.5 Installation notes 28
4.8 Installing couplings 29
4.9 Assembling/disassembling BSHF.. and BSHF.. /I helical-bevel servo gear units with a shrink disc 30
4.9.1 Installation notes 30
4.9.2 Notes on disassembling the shrink disk 33
4.9.3 Cleaning and lubricating the shrink disc 33
4.10 Motor mounting with EPH.. adapter 34
4.10.1 Installation sequence 35

4.10.2 Maximum permitted weight of motors 36
4.11 Installing torque arms for shaft mounted gear units 37
4.12 Removing the EBH.. adapter from the motor 38
4.12.1 Removing the EBH.. adapter from the motor 38

5 Startup 39
5.1 Special design feature for mounting position M5. 39
5.2 Measuring surface and oil temperature 39
5.2.1 Measuring the surface temperature 39
5.2.2 Measuring the oil temperature 40

6 Inspection and Maintenance 41
6.1 Maintenance 41
6.2 Lubricant change intervals 42
6.2.1 Fill quantities dependent on mounting position 42
6.2.2 Fill quantity tolerances 42

7 Malfunctions 43
7.1 Customer service 43
7.2 Faults and troubleshooting 43
7.3 Send in for repair 44

8 Lubricants 45
8.1 General information 45
8.2 Lubricant table for gear unit oil 45
8.3 Lubricant table for the food industry 45

9 Mounting Positions 46
9.1 General information on mounting positions 46
9.1.1 Symbols used in the mounting position sheets 48
9.2 Mounting positions for helical-bevel servo gearmotors 49
9.2.1 BSF202-802 49
9.2.2 BSBF202-802 50
9.2.3 BSHF202-802 51
9.2.4 BSHF202-802 /I 52
9.2.5 BSHF202-802 /T 53
9.2.6 BSF202-802 B 54
9.2.7 BSBF202-802 B 55
9.2.8 BSHF202-802 B 56
9.2.9 BSHF202-802 B /I 57

10 Appendix 58
10.1 Appendix: List of abbreviations 58

11 Index 59

1 Important Information about the Operating Instructions

1.1 Important notes and designated use

1.1.1 Integral part of the product

The operating instructions are part of the BSF.. helical-bevel servo gear units and contain important information for operation and service. The operating instructions are written for assembly, installation, startup and service employees who are involved in the installation and maintenance of BSF.. helical-bevel servo gear units.

1.1.2 Designated use

The designated use refers to the procedure specified in the operating instructions.

The BSF.. helical-bevel servo gear units are units run with motors for industrial and commercial systems. Gear unit loads other than the permitted values, or the operation of BSF.. helical-bevel servo gear unit in areas of application other than industrial and commercial systems, are only allowed after consultation with SEW-EURODRIVE.

In compliance with the EG Machinery Directive 98/37/EC, the BSF.. helical-bevel servo gear units are components for installation in machinery and systems. In the scope of the EC directive, you must not take the machinery into operation in the designated fashion until you have established that the end product complies with the Machinery Directive 98/37/EC.

1.1.3 Qualified personnel

BSF.. helical-bevel servo gear units represent a potential hazard for persons and material. Consequently, assembly, installation, startup and service work may only be performed by trained personnel who are aware of the potential hazards.

The personnel must be appropriately qualified for the task in hand and must be familiar with the assembly, installation, startup and operation of the product. The personnel must read the operating instructions, in particular the safety notes section, carefully and ensure that they understand and comply with them.

1.1.4 Liability for defects

Incorrect handling or any action performed that is not specified in these operating instructions could impair the properties of the product. In this case, you lose any right to claim under limited warranty against SEW-EURODRIVE GmbH & Co KG.

1.1.5 Product names and trademarks

The brands and product names contained within these operating instructions are trademarks or registered trademarks of the titleholders.

1.2 Waste disposal

Please follow the current national regulations.

Dispose of the following materials separately in accordance with the country-specific regulations in force, as:

- Steel scrap
  - Housing parts
  - Gears
  - Shafts
  - Rolling element bearing
  - Cast parts
- Aluminum scrap
  - Housing parts
  - Adapter parts
- Collect waste oil and dispose of it according to the regulations in force.

1.3 Explanation of symbols

Safety and warning instructions

Always follow the safety and warning notes in this documentation.

Electrical hazard
Possible consequences: Severe or fatal injuries.

Hazard
Possible consequences: Severe or fatal injuries.

Hazardous situation
Possible consequences: Slight or minor injuries.

Harmful situation
Possible consequences: Damage to the unit and the environment.

Tips and useful information.

A requirement of fault-free operation and fulfillment of any rights to claim under guarantee is that you adhere to the information in the **operating instructions**. **Read the operating instructions** before you start operating the unit!

The **operating instructions** contain **important information about servicing**. Therefore, keep the operating instructions **close to the unit**.

2 Safety Notes

2.1 Preliminary information

The following safety notes are primarily concerned with the use of gear units.

If using **gearmotors**, please also refer to the safety notes for motors in the corresponding operating instructions.

Please also observe the supplementary safety notes in the individual sections of this manual.

Burns hazard!

Touching the gear unit when it has not been cooled will result in burns. The gear unit can have a surface temperature of up to 95 °C.

Never touch the gear unit during operation or in the cool down phase once the unit has been switched off.

2.2 General information

Never install damaged products or take them into operation.

Submit a complaint to the shipping company immediately in the event of damage.

During or after operation, gearmotors, gear units and motors have:

- Live parts
- Moving parts
- Hot surfaces (may be the case)

Only qualified personnel may carry out the following work:

- Transportation
- Putting into storage
- Installation/assembly
- Connection
- Startup
- Maintenance
- Servicing

The following information and documents must be observed during these processes:

- Relevant operating instructions and wiring diagrams
- Warning and safety signs on the gear unit/gearmotor
- System-specific regulations and requirements
- National/regional regulations governing safety and the prevention of accidents

Serious injuries and property damage may result from:

- Improper use
- Incorrect installation or operation
- Unauthorized removal of necessary protection covers or housing

2.3 Shipping / Putting into storage

Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately. Do not operate the gear unit if it is damaged.

The screwed in transport eyebolts are only designed for the weight of the gearmotor/gear unit. Do not attach any additional loads.

If the gearmotor has two suspension eye lugs or lifting eyebolts, then you should also use both suspension eye lugs for attaching transport ropes. In this case, the tension force vector of the slings must not exceed a 45° angle in accordance with DIN 580.

Use suitable, sufficiently rated handling equipment if necessary. Remove securing devices used for transportation prior to startup.

STOP

Possible damage caused by incorrect storage!

Store the gear unit in a dry, dust-free room if it is not to be installed straight away.

2.4 Installation / assembly

Adhere to the instructions in section 4, "Mechanical Installation."

2.5 Startup / operation

Ensure that the following requirements have been met before startup:

- Monitoring and protection devices may not be deactivated. This requirement also applies to the test run.
- Do **not** operate the gear units under the following ambient conditions:
  - Potentially-explosive atmosphere
  - Oils
  - Acids
  - Gases
  - Vapors
  - Radiation
- The ambient temperature must be between -20 °C and +40 °C according to the lubricant table in section 8, "Lubricants." It is essential that you contact SEW-EURODRIVE if ambient temperatures exceed this range.
- Only operate the gear units when there is sufficient ventilation to prevent heat build-up.

Also refer to the information in Sec. 5, "Startup."

2.6 Inspection and maintenance

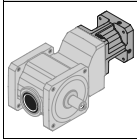
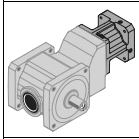
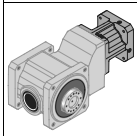
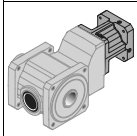
Comply with the instructions in section 6, "Inspection and Maintenance."

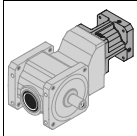
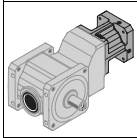
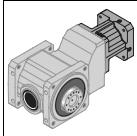
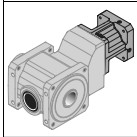
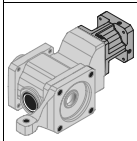
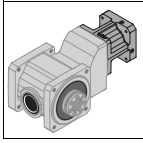
3 Delivery Scope and Unit Design

For scope of delivery and project planning, refer to the "Low Backlash Geared Servomotors (BSF.., PSF..)" catalog and the operating instructions for the motor used to drive the gear unit.

The operating instructions for BSF.. helical-bevel servo gear units are available for download in the Internet at the following address: "www.sew-eurodrive.de."

3.1 Types and options

BSF.. helical-bevel servo gear units with B5 output flange		
Type		**Meaning**
	BSF..	Helical-bevel servo gear units with solid shaft
	BSKF..	Helical-bevel servo gear units with solid shaft and key
	BSBF..	Helical-bevel servo gear units with flange block shaft to EN ISO 9409
	BSHF..	Helical-bevel servo gear units with hollow shaft and **shrink disc opposite the output end**
Table continued on next page.		

BSF..B helical-bevel servo gear units with foot and front threaded holes for mounting		
Type		**Meaning**
	BSF..B	Helical-bevel servo gear units with solid shaft
	BSKF..B	Helical-bevel servo gear units with solid shaft and key
	BSBF..B	Helical-bevel servo gear units with flange block shaft to EN ISO 9409
	BSHF..B	Helical-bevel servo gear units with hollow shaft and **shrink disc opposite the output end**
Options for BSF.. helical-bevel servo gear units		
Type		**Meaning**
	BSF.. /R	Option for reduced circumferential backlash. This **option applies to all types** of helical-bevel servo gear units.
	BSHF.. /T	Helical-bevel servo gear units with torque arm. This **option only applies to BSHF..** helical-bevel servo gear units **with shrink discs opposite the output end.**
	BSHF.. / I	Helical-bevel servo gear units with hollow shaft and **shrink disc on the output end**. A **torque arm is not** available for the **BSHF../I helical-bevel servo gear units**.

3.2 Unit designation and nameplate

3.2.1 Example: Unit designation of BSF.. helical-bevel servo gear units with EBH adapter

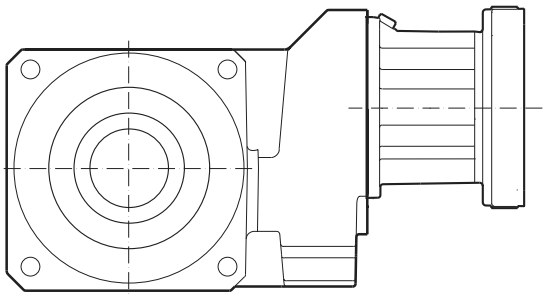


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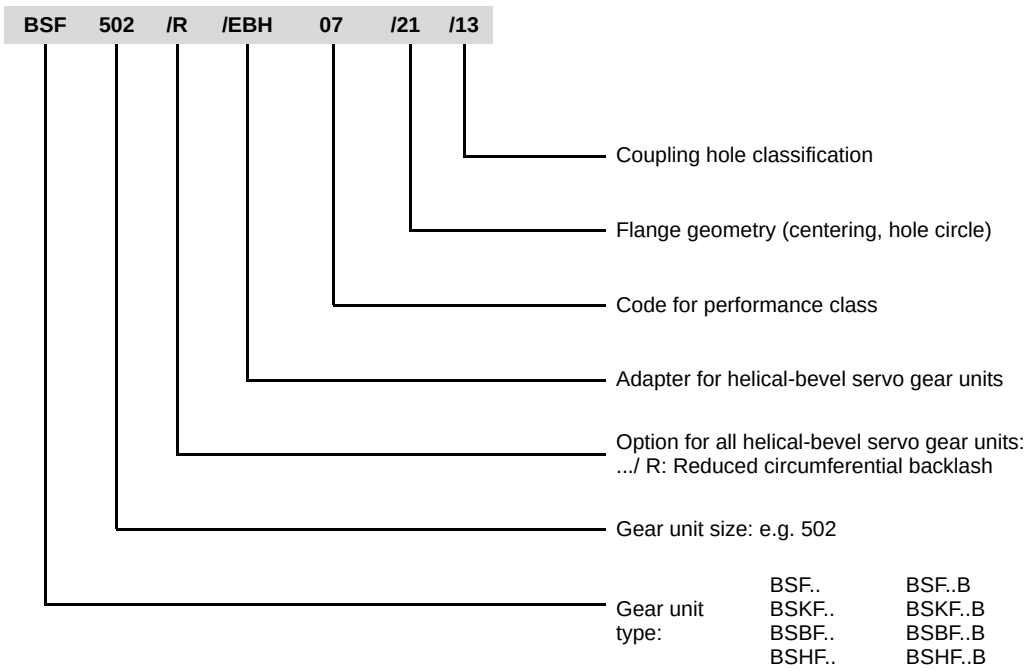
Figure 1: BSF.. helical-bevel servo gear units with EBH adapter

The unit designation of the BSF.. helical-bevel servo gear unit with adapter begins with the series of the gear unit.

For example, a helical-bevel servo gear unit with adapter has the following unit designation:



3.2.2 Nameplate for helical-bevel servo gear units with EBH adapter

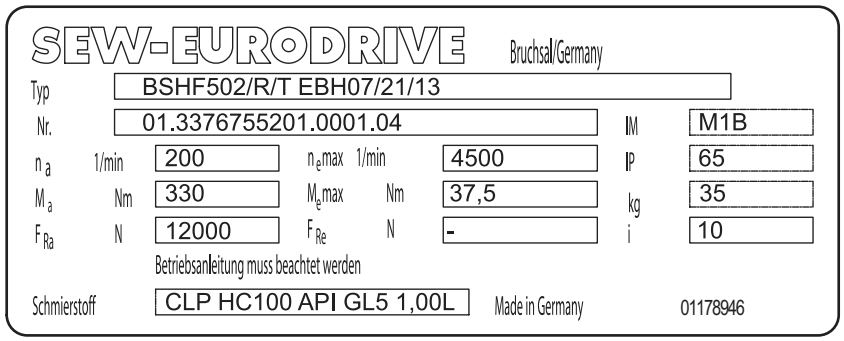


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Figure 2: Sample nameplate

F_{Ra}	[N]	= overhung load on the output side
F_{Re}	[N]	= overhung load on the input side
i		= Gear unit reduction ratio
IM		= Mounting position
IP..		= Enclosure
n_{emax}	[1/min]	= maximum input speed
n_a	[1/min]	= output speed
M_{emax}	[Nm]	= maximum input torque
M_a	[Nm]	= output torque

3.2.3 Example: Unit designation for BSBF.. helical-bevel servo gearmotors

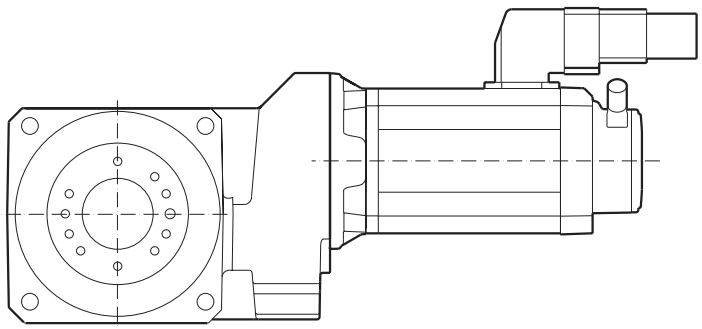

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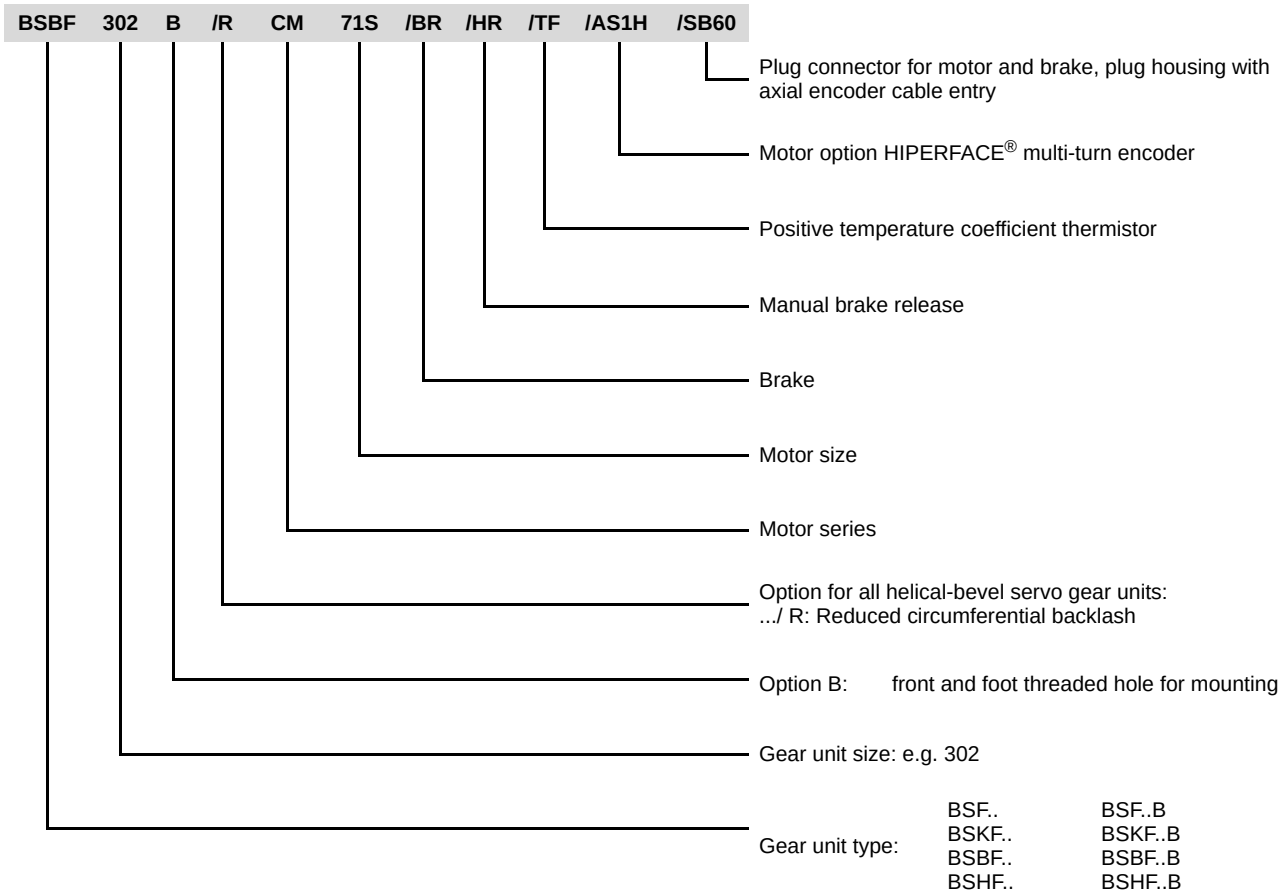
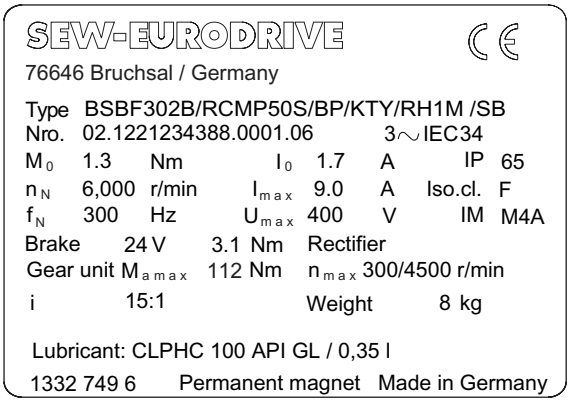
Figure 3: Example of the unit designation for a BSBF.. helical-bevel servo gearmotor

A helical-bevel servo gearmotor with brake, manual brake release, positive temperature coefficient thermistor and plug connector with a connection cross section of 1.5 mm^2 has, for example, the following unit designation:


BSBF 302 B /R CM 71S /BR /HR /TF /AS1H /SB60
Plug connector for motor and brake, plug housing with axial encoder cable entry
Motor option HIPERFACE® multi-turn encoder
Positive temperature coefficient thermistor
Manual brake release
Brake
Motor size
Motor series
Option for all helical-bevel servo gear units: .../ R: Reduced circumferential backlash
Option B: front and foot threaded hole for mounting
Gear unit size: e.g. 302
Gear unit type:
BSF.. BSF..B
BSKF.. BSKF..B
BSBF.. BSBF..B
BSHF.. BSHF..B

3.2.4 Nameplate for helical-bevel servo gear units with direct mounting


SEW-EURODRIVE
76646 Bruchsal / Germany
Type BSBF302B/RCMP50S/BP/KTY/RH1M /SB
Nro. 02.1221234388.0001.06 3~ IEC34
M0 1.3 Nm I0 1.7 A IP 65
nN 6,000 r/min Imax 9.0 A Iso.cl. F
fN 300 Hz Umax 400 V IM M4A
Brake 24 V 3.1 Nm Rectifier
Gear unit Mamax 112 Nm nmax 300/4500 r/min
i 15:1 Weight 8 kg
Lubricant: CLPHC 100 API GL / 0,35 l
1332 749 6 Permanent magnet Made in Germany

59767AEN

Figure 4: Sample nameplate for direct mounting

Note The nameplate of the BSF.. helical-bevel servo gearmotor is fixed to the servomotor.

3.3 Gear unit design

The following illustrations are intended to explain the general structure. Their purpose is only to make it easier to assign components to the spare parts lists. Discrepancies may occur depending on the gear unit size and version!

3.3.1 Basic design of the helical-bevel servo gear units BSF.. , BSHF.. and BSKF..

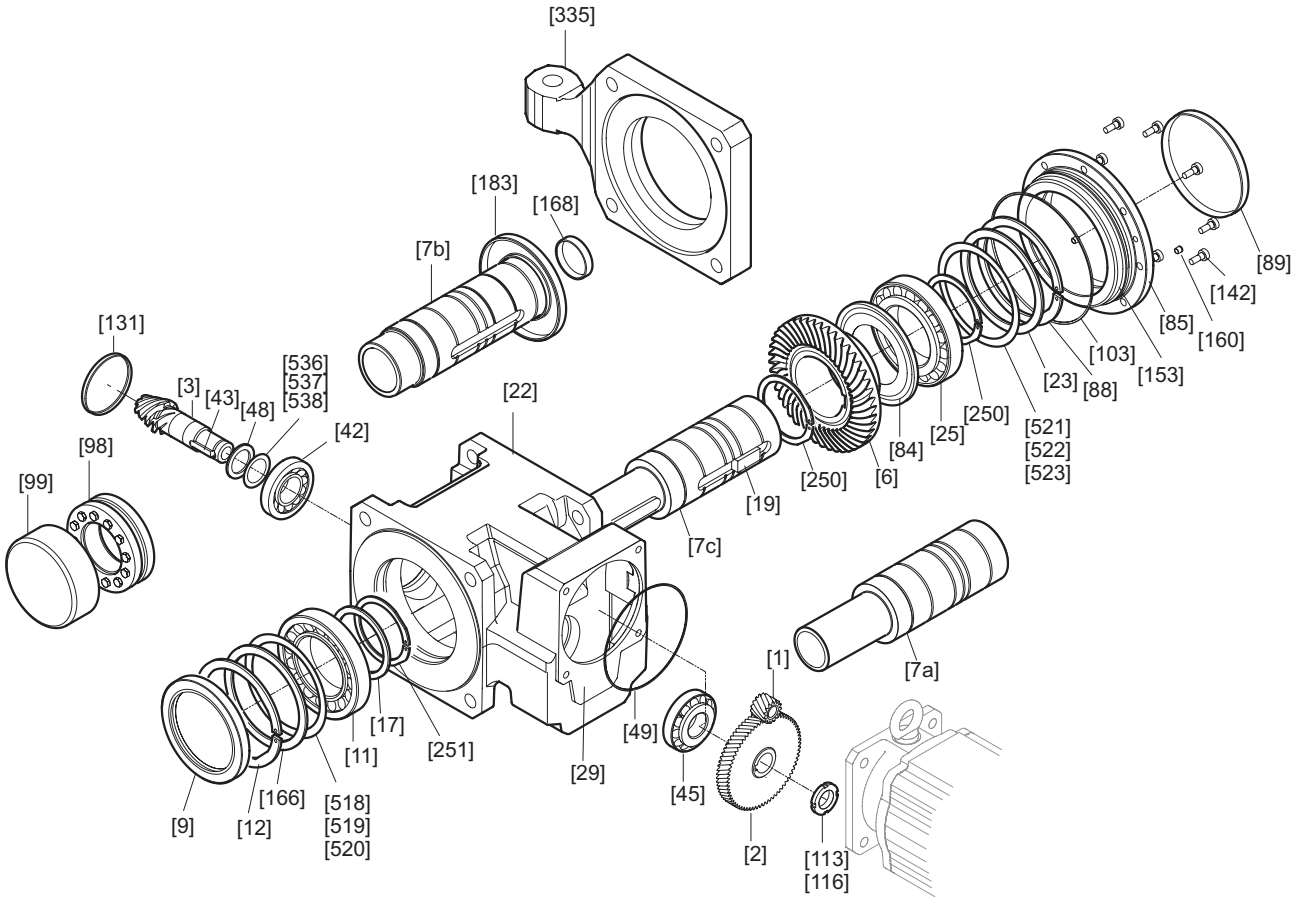


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Figure 5: Basic design of the helical-bevel gear units BSF.. , BSHF.. and BSKF..

[1]	Pinion	[23]	Supporting ring	[98]	Shrink disc	[250]	Circlip
[2]	Gearwheel	[25]	Tapered roller bearing	[99]	Protection cover	[251]	Circlip
[5]	Bevel pinion shaft	[29]	Adh.+sealing compound	[103]	O-ring	[335]	Torque arm
[6]	Bevel gear	[42]	Tapered roller bearing	[113]	Slotted round nut	[518]	Shim
[7a]	Output shaft (BSF..)	[43]	Key	[116]	Thread locker	[519]	Shim
[7b]	Output shaft (BSKF..)	[45]	Tapered roller bearing	[131]	Closing cap	[520]	Shim
[7c]	Key (BSKF..)	[48]	Supporting ring	[142]	Machine screw	[521]	Shim
[9]	Oil seal	[49]	O-ring	[153]	Adhesive and sealing compound	[522]	Shim
[11]	Tapered roller bearing	[84]	Nilos ring[1)]	[160]	Closing plug	[523]	Shim
[17]	Supporting ring	[85]	Centering flange	[166]	Supporting ring	[536]	Shim
[19]	Key	[88]	Circlip	[168]	Protection cap	[537]	Shim
[22]	Gear unit housing	[89]	Closing cap	[183]	Oil seal	[538]	Shim

1) only for mounting position M5

3.3.2 Basic design of the BSBF.. helical-bevel servo gear units

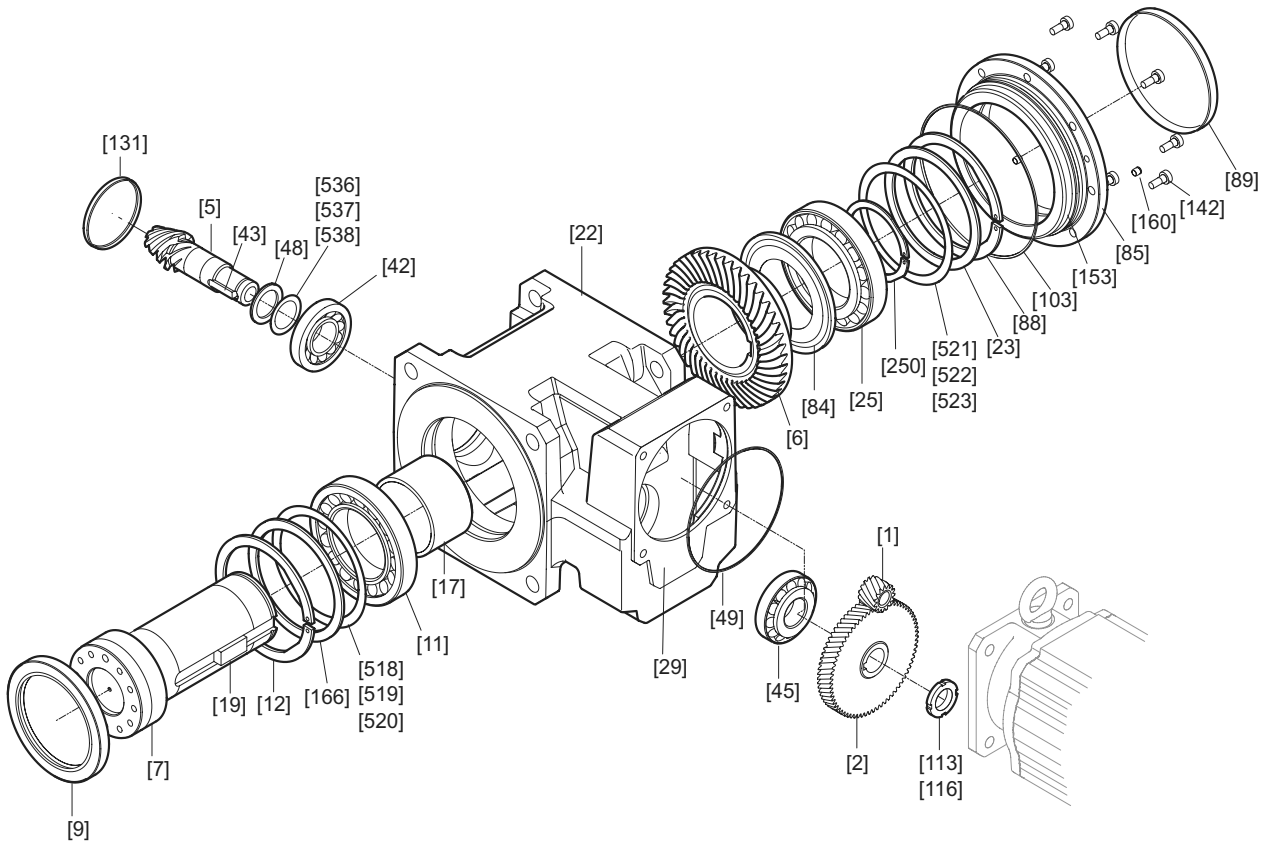

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Figure 6: Basic design of the BSBF.. helical-bevel gear units

[1]	Pinion	[23]	Supporting ring	[89]	Closing cap	[519]	Shim
[2]	Gearwheel	[25]	Tapered roller bearing	[103]	O-ring	[520]	Shim
[5]	Bevel pinion shaft	[29]	Adhesive and sealing compound	[113]	Slotted round nut	[521]	Shim
[6]	Bevel gear	[42]	Tapered roller bearing	[116]	Thread locker	[522]	Shim
[7]	Output shaft	[43]	Key	[131]	Closing cap	[523]	Shim
[9]	Oil seal	[45]	Tapered roller bearing	[142]	Machine screw	[536]	Shim
[11]	Tapered roller bearing	[48]	Supporting ring[1)]	[153]	Adhesive and sealing compound	[537]	Shim
[12]	Circlip	[49]	O-ring	[160]	Closing plug	[538]	Shim
[17]	Spacer	[84]	Nilos ring [2)]	[166]	Supporting ring		
[19]	Key	[85]	Centering flange	[250]	Circlip		
[22]	Gear unit housing	[88]	Circlip	[518]	Shim		

1) The supporting ring is not available for the bevel gear stage i = 3

2) only for mounting position M5

3.3.3 Basic design of an adapter for helical-bevel servo gear units

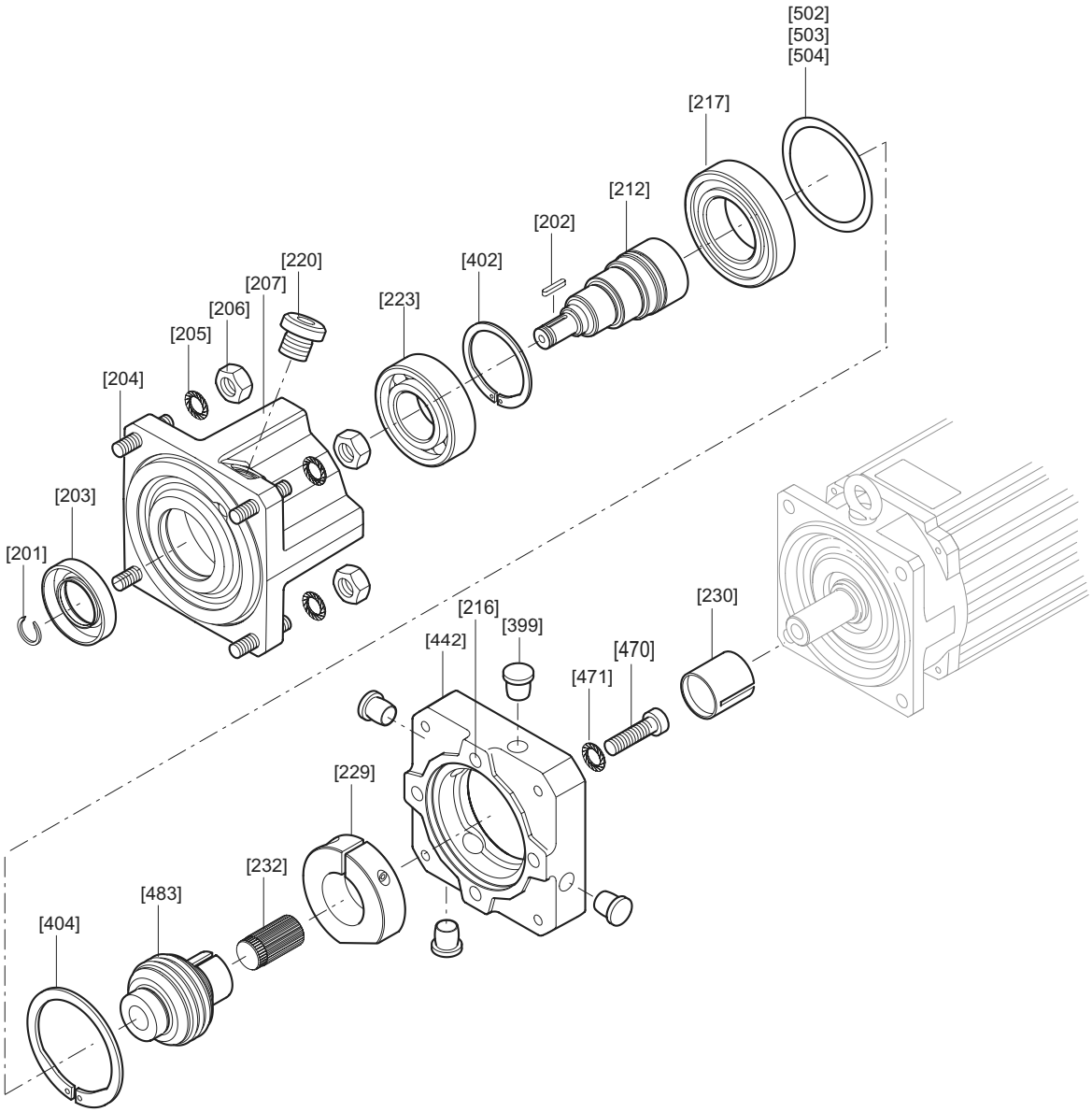

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Figure 7: Basic design of the adapter for helical-bevel servo gear units

[201]	Circlip[1] / Spring ring	[217]	Grooved ball bearing	[404]	Circlip
[202]	Key	[220]	Screw plug[2] / Breather valve[3]	[442]	Adapter flange
[203]	Oil seal with optimized spring force	[223]	Grooved ball bearing	[470]	Machine screw
[204]	Stud	[229]	Locking collar	[471]	Washer
[205]	Washer	[230]	Coupling sleeve	[483]	Coupling
[207]	Flange	[232]	Press-fit bolt	[502]	Shim
[212]	Adapter shaft	[399]	Closing plug	[503]	Shim
[216]	Adhesive and sealing compound	[402]	Circlip	[504]	Shim

1) Depending on the adapter type
2) only for mounting positions M1 ... M3, M5, M6
3) only for mounting position M4

4 Mechanical Installation

4.1 Before you start

The drive may only be installed if:

- The entries on the nameplate of the motor match the voltage supply system
- The drive is undamaged i.e. no damage caused by transportation or storage.

4.2 Prerequisites for installation

- You must clean the output shafts and flange surfaces thoroughly to ensure they are free of anti-corrosion agents, contamination or similar. Use a commercially available solvent.

Possible material damages!

Do not let the solvent come into contact with the sealing lips of the oil seals!

- Do not assemble the drive without having ensured that there will be sufficient ventilation after installation to prevent heat build-up.

- When the drive is installed in abrasive ambient conditions, protect the output end oil seals against wear.

4.3 Required tools / resources

- Set of wrenches
- Torque wrench + set of screwdrivers with long hexagon shaft
- Mounting device
- Shims and distance rings, if necessary
- Fixing devices for input and output elements

4.4 Installing the gear unit

The gear unit is only allowed to be installed in the specified mounting position on a level[1)] and torsionally rigid support structure. Otherwise, impermissibly high additional forces may occur that can cause the gear unit to fail prematurely. Vibrations from the environment must be avoided.

Use screws according to the following table to secure helical-bevel servo gearmotors:

Gear unit size	Screw quality
BSF..202, BSF..302, BSF..402, BSF..502, BSF..602, BSF..802	8.8
BSF..202B, BSF..302B, BSF..402B	8.8
BSF..502B, BSF..602B, BSF..802B	10.9

Drain screws and breather valves must be easily accessible!

Use plastic inserts (2-3 mm thick) if there is a risk of electrochemical corrosion between the gear unit and the driven machine. The material used must have an electrical bleeder resistor $< 10^9\ \Omega$. Electrochemical corrosion can occur between various metals, for example, cast iron and high-grade steel. Also fit the bolts with plastic washers!

1) Maximum permitted deviation for flange attachment to DIN ISO 1101.

4.5 Installation in the machine

The mounting positions and the position of the output shafts are defined in section 9.

4.5.1 BSF.. helical-bevel servo gear unit: Mounting at gear unit end via the B5 mounting flange

Mounting position M1 B:

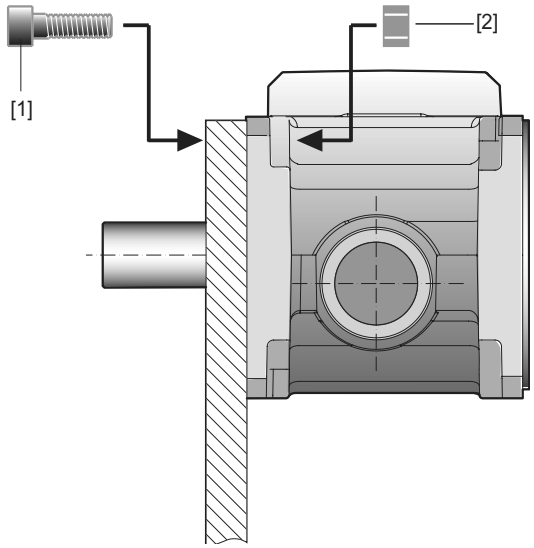

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Figure 8: Installing the BSF.. helical-bevel servo gear unit in the machine

[1] Screws of quality 8.8

[2] Nut

4.5.2 BSBF..B helical-bevel servo gear unit: Mounting at the foot end

Mounting position M1 A:

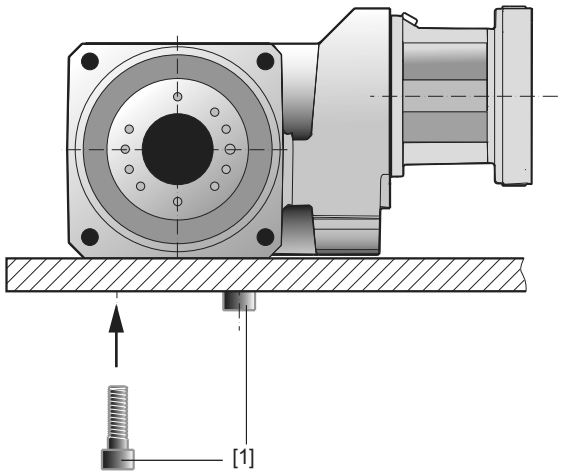

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Figure 9: Foot mounting for the BSBF..B helical-bevel servo gear unit in a machine

[1] Screws of quality 10.9 are only for use in sizes BSBF502B to BSBF802B; for the other gear units, use screws of quality 8.8.

4.5.3 BSBF..B helical-bevel servo gear unit: Mounting at the front end

Mounting position M4 A:

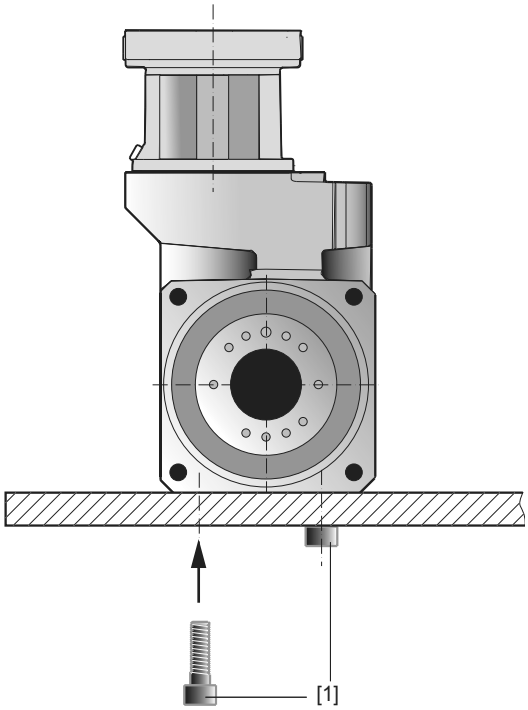

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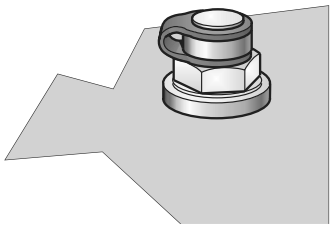
Figure 10: Front end mounting for the BSBF..B helical-bevel servo gear unit in a machine

[1] Screws of quality 10.9 are only for use in sizes BSBF502B to BSBF802B; for the other gear units, use screws of quality 8.8.

4.6 Activating the breather valve

As a rule, the breather valve is already activated at the factory (only for mounting position M4). If the breather valve has not been activated, you must remove the transport fixture from the breather valve before starting up the gear unit!

1. Breather valve with transport fixture



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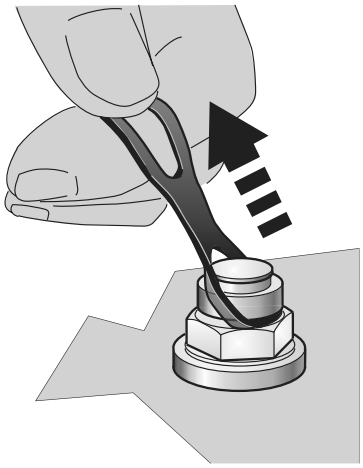
2. Remove transport fixture



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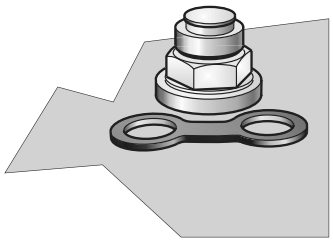
3. Activated breather valve



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Information on painting the gear unit:

If all or some of the surfaces of the drive are to be painted, make sure that you carefully mask over the breather valve and the oil seals. Remove the strips of tape after completing the painting work.

If you want to paint the BSF.. helical-bevel servo gear unit, check that the new paint is compatible with the existing protective varnish. If they are incompatible, this can damage the paint, which means that the protective properties of the paint may no longer be ensured.

4.7 Mounting output elements on solid shafts

When mounting and removing output elements, be careful not to damage the gear unit shaft as this could damage the helical-bevel servo gear unit. In this case, your right to claim against EW-EURODRIVE GmbH & Co KG under warranty becomes invalid.

4.7.1 Assembly with key

The following figure shows a sample mounting device for installing couplings [3] or hubs onto motor or gear unit shaft ends. It may be possible to dispense with the thrust bearing [2] on the mounting device.

In the **BSF.. / BSKF.. series**, you can use the **shaft shoulder** (see position [1]) as the defined **stop when mounting input and output elements**.

The output shafts are coated with an **antirust agent** on delivery. **Remove** the antirust agent **before assembly**, e.g. using benzine.

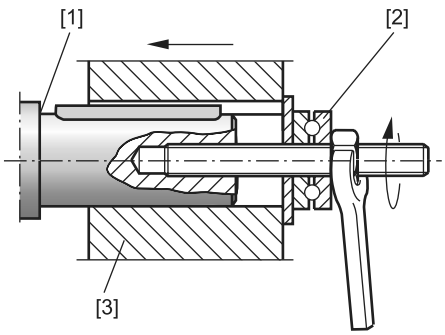

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Figure 11: Assembly with mounting device

[1] Shaft shoulder
[2] Thrust bearing
[3] Coupling hub

4.7.2 Assembly without key

The following figure is an example of shaft assembly with clamping set.

When using, for example, clamping sets with smooth shaft ends, ensure that the shaft is free from residue and that any grease is removed. It is essential to make sure that the **clamping area** [5] is **free from grease**. Otherwise the shaft/hub connection may not function properly.

To prevent corrosion on the shaft **grease** any uncovered areas [4] **after assembly**.

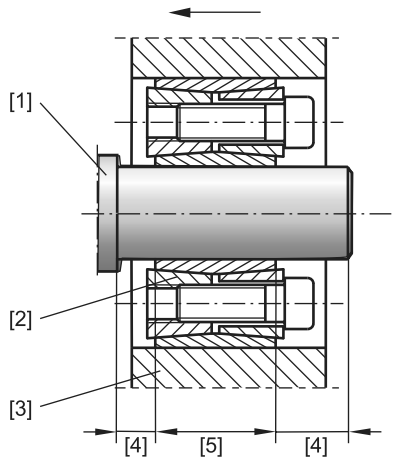

Figure 12: Assembly with clamping sets

[1] Shaft shoulder
[2] Clamping set
[3] Output element, e. g. gear or sprocket
[4] Greased shaft areas
[5] Ungreased clamping area

4.7.3 Avoiding impermissibly high overhung loads

The following illustration shows the correct mounting arrangement of a gear or chain sprocket for avoiding impermissibly high overhung loads.

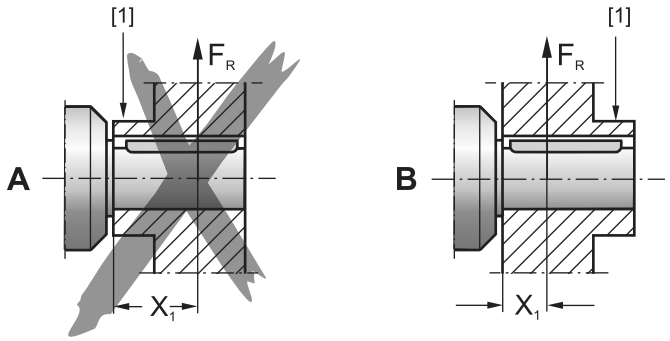

Figure 13: Mounting arrangement of a gear or sprocket wheel

[1] Hub

Illustration A = Incorrect

Illustration B = Correct

4.7.4 Inner and outer centering rings for flange block gear units

The following illustration shows the correct mounting arrangement for a shaft connection with an inner and outer centering ring.

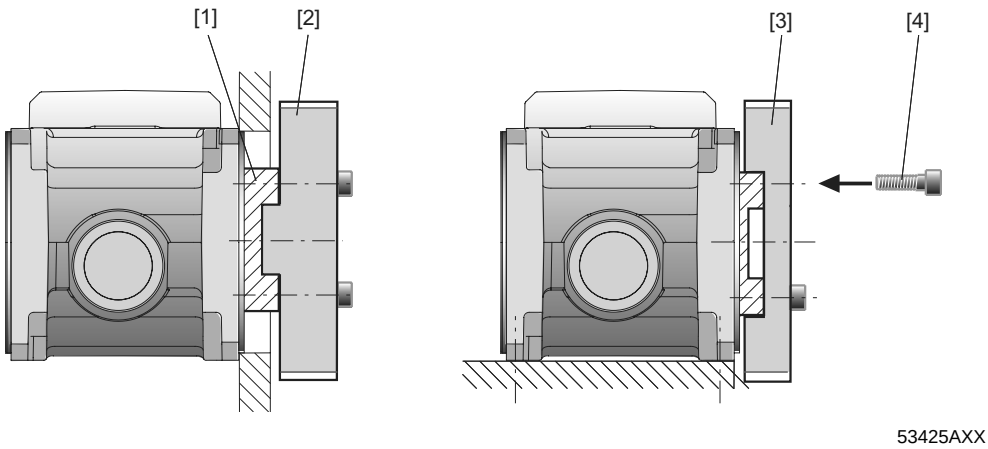

Figure 14: Sample mounting for a BSBF.. flange block

[1] Flange block

[2] Gear / belt pulley with inner centering ring

[3] Gear / belt pulley with outer centering ring

[4] Screws of quality 12.9

4.7.5 Installation notes

Observe the following installation instructions:

- Only use a mounting device for installing input and output elements. Use the center bore and the thread on the shaft end for positioning.
- Never drive belt pulleys, couplings, pinions, etc. onto the shaft end by hitting them with a hammer as this can damage the bearings, housing and shaft.
- In the case of belt pulleys, make sure the belt is tensioned correctly in accordance with the manufacturer's instructions.
- Power transmission elements should be balanced after fitting and must not give rise to any impermissible radial or axial forces (see the Low-Backlash Geared Servomotor" catalog for permitted values).

Only use screws in strength class 12.9 to fasten the output elements onto the helical-bevel servo gear unit; see the following table:

Machine screws with hexagon socket to DIN EN ISO 4762	Strength class	Tightening torque [Nm]
M4	12.9	5.1
M5	12.9	10
M6	12.9	18
M8	12.9	43
M10	12.9	84
M12	12.9	145

Mounting is easier if you heat the bore of the output element briefly to between 80 °C and 100 °C.

4.8 Installing couplings

Note the following when installing couplings according to the coupling manufacturer's specifications:

A Balance the maximum and minimum clearance

B Balance the axial misalignment

C Balance the angular misalignment

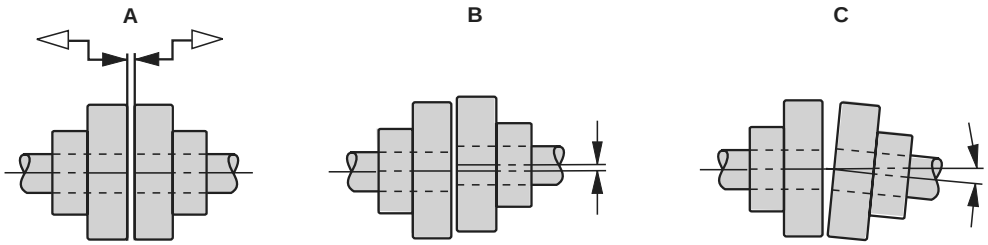

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Figure 15: Maximum and minimum clearance (A), axial misalignment (B), angular misalignment (C)

Caution! Risk of crushing and injury!

Input and output elements such as belt pulleys, couplings, etc. must be covered with a touch guard to prevent injuries.

4.9 Assembling/disassembling BSHF.. and BSHF.. /l helical-bevel servo gear units with a shrink disc

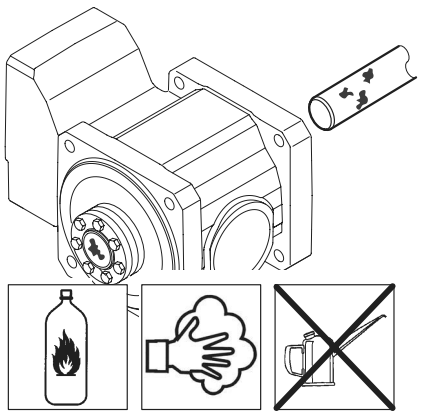
4.9.1 Installation notes

- Do not tighten the locking screws unless a shaft is installed, otherwise the hollow shaft could become deformed!

BSHF.. helical-bevel servo gear units

BSHF../l helical-bevel servo gear units

1. Carefully degrease the hollow shaft hole and the machine shaft.



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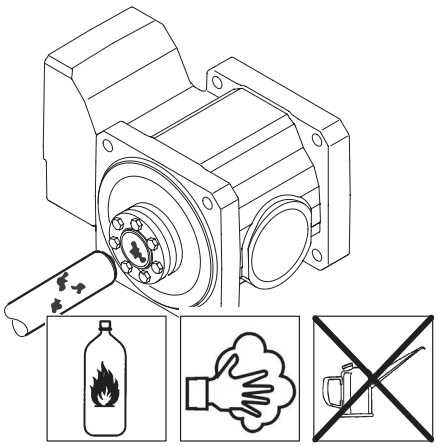

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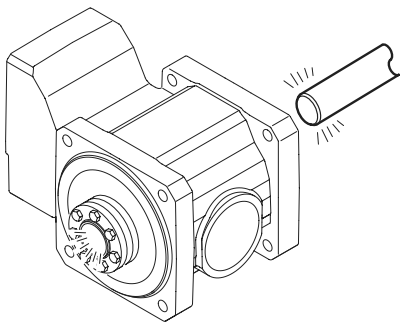
2. Degreased hollow shaft/machine shaft



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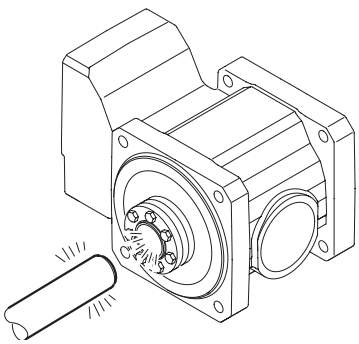

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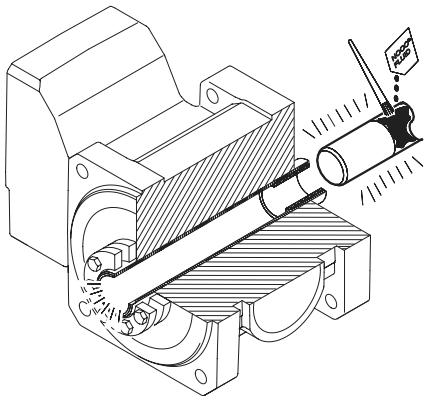
BSHF.. helical-bevel servo gear units

BSHF../I helical-bevel servo gear units

3. Apply NOCO® fluid to the machine shaft[1] in the area of the bushing.



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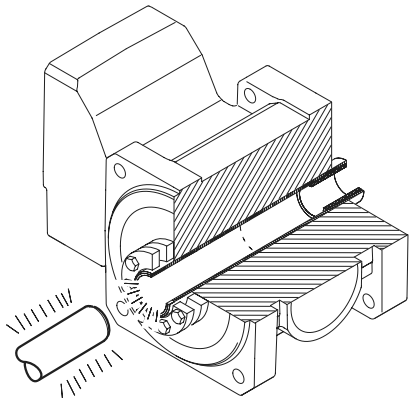

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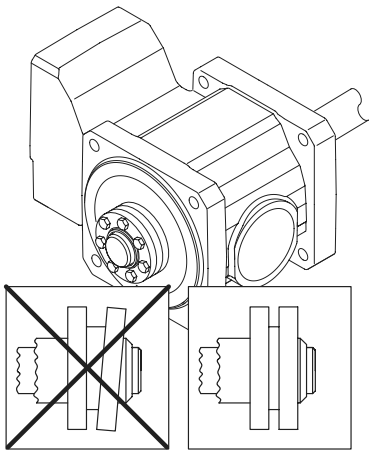
4. Install the shaft, making sure that the locking collars of the shrink disk are installed in parallel to each other[2].



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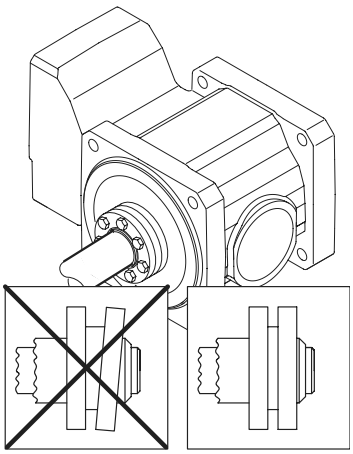

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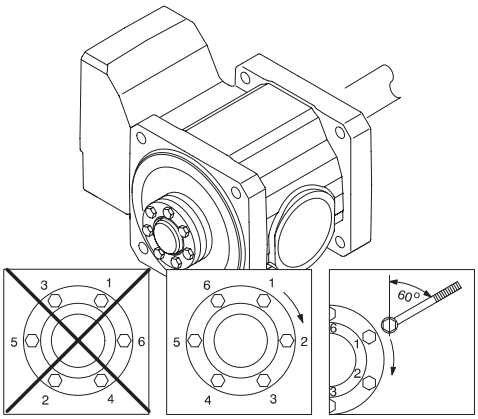
1) It is essential to make sure that the clamping area remains free from grease. For this reason, never apply NOCO® fluid directly to the bushing as the paste may be able to get into the clamping area of the shrink disk when the input shaft is put on.

2) **After assembly**, grease the outside of the hollow shaft in the area of the shrink disk to prevent corrosion.

BSHF.. helical-bevel servo gear units

BSHF../l helical-bevel servo gear units

5. Tighten the locking bolts by working round several times from one bolt to the next (not in diametrically opposite sequence). The tightening torques are listed in the table below.



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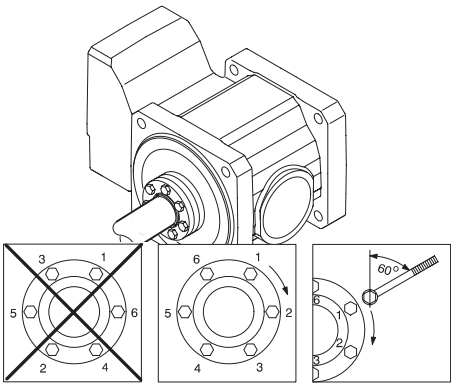

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Gear unit type	Bolt	Tightening torque [Nm]	◁ max.[1)]
BSHF202	M5 x 16 - 8.8	5	60°
BSHF302	M5 x 16 - 8.8	5	
BSHF402	M6 x 25 - 10.9	12	
BSHF502	M6 x 25 - 10.9	12	
BSHF602	M6 x 30 - 10.9	12	
BSHF802	M8 x 40 - 10.9	30	

1) Maximum tightening angle per rotation

4.9.2 Notes on disassembling the shrink disk

1. Unscrew the locking bolts evenly one after the other. Each locking bolt may only be unscrewed by about one quarter turn in the initial cycle. This is in order to avoid tilting and jamming the locking collars. Do not fully unscrew the locking bolts!
2. Remove any rust that may have formed between the hub and the end of the shaft.
3. Remove the shaft or pull the hub off the shaft.
4. Pull the shrink disk off the hub.

Caution: Risk of injury!

Disassembling the shrink disc incorrectly could result in injury.

4.9.3 Cleaning and lubricating the shrink disc

There is no need to strip down and re-grease disassembled shrink disks before they are screwed back on.

The shrink disk only needs to be cleaned and re-greased if it is contaminated.

Use one of the following solid lubricants for the tapered surfaces.

Lubricant (Mo S_2)	Form
Molykote 321 (lube coat)	Spray
Molykote spray (powder spray)	Spray
Molykote G Rapid	Spray or paste
Aemasol MO 19P	Spray or paste
AemasolDIO-sétral 57 N (lube coat)	Spray

Grease the locking bolts with a multipurpose grease such as Molykote BR 2 or similar.

4.10 Motor mounting with EPH.. adapter

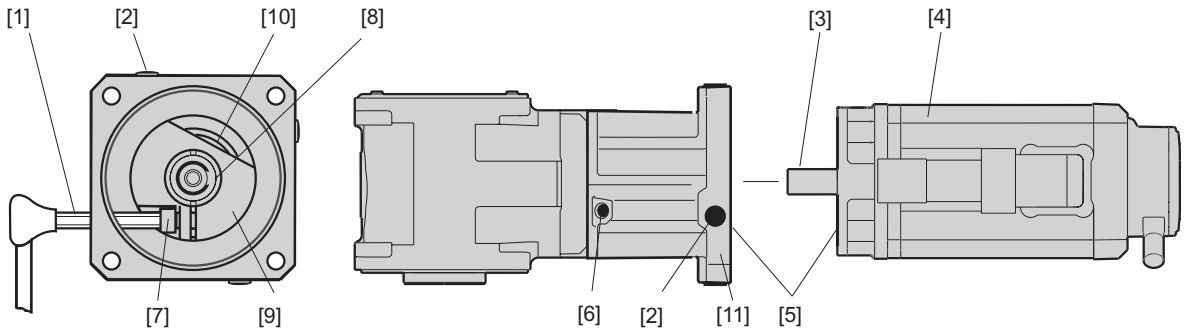

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Figure 16: Motor mounting with EBH.. adapter

[1] Torque wrench
[2] Closing plug
[3] Motor shaft
[4] Motor
[5] Face
[6] Breather valve (only for mounting position M4)
[7] Clamping screw
[8] Coupling sleeve
[9] Clamping ring with socket head screw
[10] Coupling
[11] EBH adapter
[12] Bellows coupling

When installing or removing the EBH.. adapter, take care not to tilt or jam the servomotor, otherwise the function for transferring the torque may not work properly.

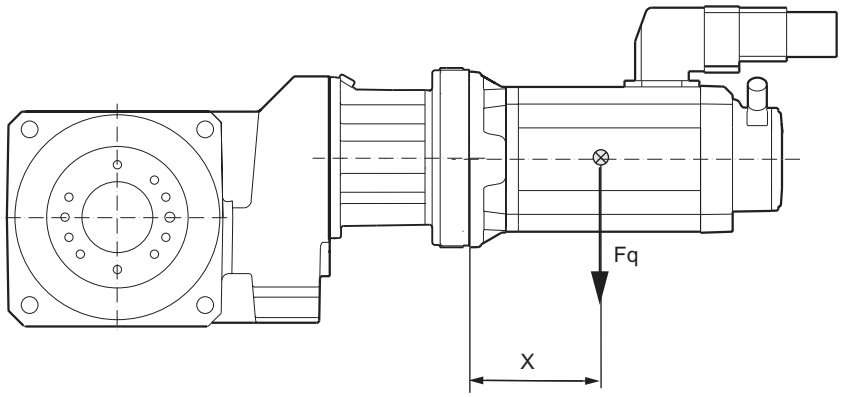
4.10.1 Installation sequence

Observe the following sequence for installation:

1. A motor [4] with a minimum rotational accuracy to DIN 42955 can be mounted in any position. Protect the encoder and other assemblies.
2. Check the plane surfaces [5] of the motor and adapter for scoring and smooth them if necessary.
3. Clean and degrease the hollow shaft bore in coupling [10] and motor shaft [3].
4. Remove one of the four closing plugs [2].
5. Turn the coupling [10] with the clamping ring [9] until the screw head of the clamping screw (7) is in alignment with the mounting hole in the built-on housing. Loosen the clamping screw [7].
   – For motors with a keyway: Turn the key by 90° to the slots in the adapter shaft. To compensate imbalance, we recommend inserting a half key in the keyway.
6. If using coupling sleeves [8], make sure that the slots in the coupling sleeve [8] are in alignment with the slots in the coupling [10] and clamping ring [9].
7. Carefully slide the gear unit onto the motor shaft [3].
8. Insert the connecting screws through the holes of the motor flange into the threads of the adapter flange and tighten the screws slightly.
9. Tighten the screws diagonally with even force.
10. Use a torque wrench [1] to tighten the clamping screw [7] to the prescribed tightening torque; see the table below.

Adapter type	Motor shaft diameter [mm]	Number of clamping screws	Tightening torque of clamping screws [Nm]	Wrench size
EBH03	≤ 14	1	18	5
EBH04	≤ 19	1	18	5
EBH05	≤ 24	1	43	6
EBH06	≤ 35	1	43	6
EBH07	≤ 35	1	43	6
EBH08	≤ 38	1	83	8
EBH09	≤ 42	1	83	8
EBH10	≤ 55	1	145	10

4.10.2 Maximum permitted weight of motors



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⊗ .. Motor's center of gravity

X .. Distance from adapter flange to the middle of the motor

Fq .. Overhung load

Gear unit type	Adapter type EBH	X [mm]	Fq [N][1)]
BSF..202 BSF..302	EBH03/03-14	182	157
	EBH04/12-14	182	157
	EBH05/14-20	220	273
BSF..402	EBH03/03-14	182	157
	EBH04/12-14	182	157
	EBH05/14-20	220	273
	EBH06/19	290	312
	EBH07/20-22	290	312
BSF..502 BSF..602	EBH03/03-14	182	157
	EBH04/12-14	182	157
	EBH05/14-20	220	273
	EBH06/19	290	312
	EBH07/20-22	290	312
	EBH08/22	351	600
BSF..802	EBH05/14-20	220	273
	EBH06/19	290	312
	EBH07/20-22	290	312
	EBH08/22	351	600
	EBH09/22-24	400	680
	EBH10/24-24	400	680

1) Maximum load values for connection screws of strength class 8.8. The maximum permitted weight of the attached motor F_{qmax} must be reduced proportionally as the distance between the adapter flange and the middle of the motor (x) increases When this distance is reduced, F_{qmax} cannot be increased.

4.11 Installing torque arms for shaft mounted gear units

Do not place torque arms under strain during installation.

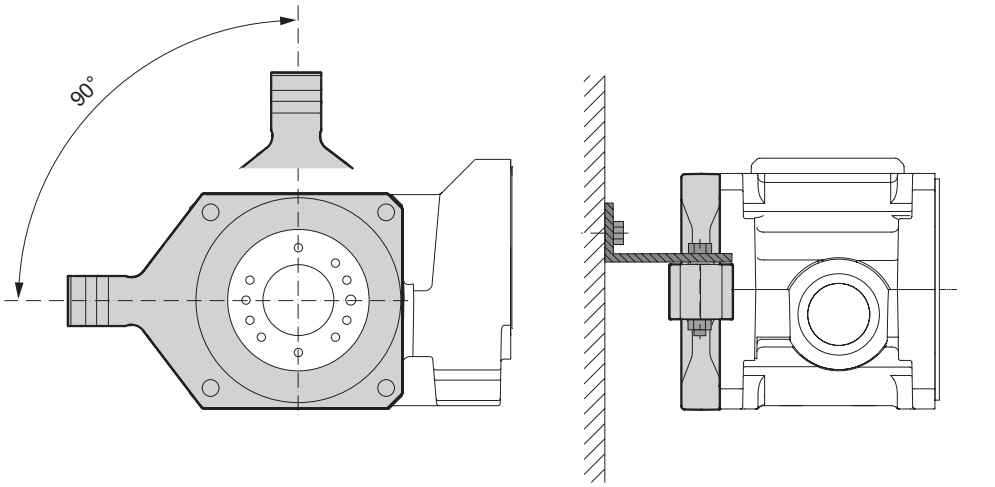


Figure 17: Torque arm for BSHF../T helical-bevel servo gear units

4.12 Removing the EBH.. adapter from the motor

If the customer removes the adapter from the helical-bevel servo gear units, this can cause the unit to malfunction!

Never remove the EBH.. adapter for the BSF.. helical-bevel gear unit yourself . If customers remove the adapter themselves, this can cause the unit to malfunction. In this case, the customer's right to claim on warranty is no longer valid.

4.12.1 Removing the EBH.. adapter from the motor

1. Switch off the drive
2. Secure the load
3. Turn off the power supply to the motor
4. Allow the drive to cool
5. Unscrew the clamping screws
6. Unscrew the connection screws between the motor and adapter
7. Remove the motor without tilting or jamming it

5 Startup

Check that the direction of rotation is correct in decoupled status. Listen out for unusual grinding noises as the shaft rotates.

Secure the keys for the test run without output elements. Do not deactivate monitoring and protection devices for the test run.

Switch off the gearmotor if in doubt whenever changes occur in relation to normal operation, e.g. noises or vibrations. Determine the cause of the fault and, if necessary, contact SEW-EURODRIVE.

Gear units with motor adapter

For gear units with an adapter, you must ensure that the data specified in the project planning documents for the gear unit is not exceeded. It is essential that the gear unit is not overloaded.

Inverter-operated gearmotors

The parameter settings made for the inverter must prevent the gear unit from being overloaded. Refer to the project planning documents for the correct gear unit data.

5.1 Special design feature for mounting position M5.

With mounting position M5, it is important that you only operate the gear unit at a maximum of 50 % of the limit speed for the first 24 hours of operation.

5.2 Measuring surface and oil temperature

The nameplate data on maximum surface temperature is based on measurements at standard ambient conditions and installation altitudes. Even slight changes of these conditions, such as limited installation space, can have a tremendous impact on the temperature.

5.2.1 Measuring the surface temperature

It is absolutely necessary to measure the surface temperature at maximum load during startup of the gear unit. A commercially available thermometer is sufficient for this measurement.

Measure the surface temperature at the transition space between the gear unit and adapter where the position of the terminal box prevents venting by the motor fan. The maximum surface temperature will be reached after approximately three hours and may not exceed a difference value of 55 K when compared with the ambient temperature.

Switch off the drive immediately if the temperature exceeds 55 K compared with the ambient temperature. Contact SEW-EURODRIVE in this case.

5.2.2 Measuring the oil temperature

The oil temperature must be measured to determine the lubricant change intervals stipulated in the section "Inspection and Maintenance." To do so, measure the temperature at the bottom of the gear unit. Add 10 K to the measured value. Use this temperature value to determine the lubricant change interval.

6 Inspection and Maintenance

6.1 Maintenance

The BSF.. helical-bevel servo gear units are designed for high endurance when operated according to the designated use specified in the catalog. Wearing parts are an exception, for example, the bearings, oils seals for the specific application and the lubricant.

The maintenance work listed in the table below must be carried out for the BSF.. helical-bevel servo gear units.

Time interval	What to do?
• Every 3000 machine hours, at least every 6 months	• Check running noise for possible bearing damage • Check the adapter visually for leakage • Check the seals visually for leakage If you notice a leakage, contact service.
• If required (depending on external factors)	• Touch up or renew the surface / anticorrosion coating
• Depending on the operating conditions, at the latest every 5 years	• Change synthetic oil • Touch up or renew the surface / anticorrosion coating
• After 25000 ... 30000 operating hours	• Renew the anti-friction bearing grease • Change the oil seal

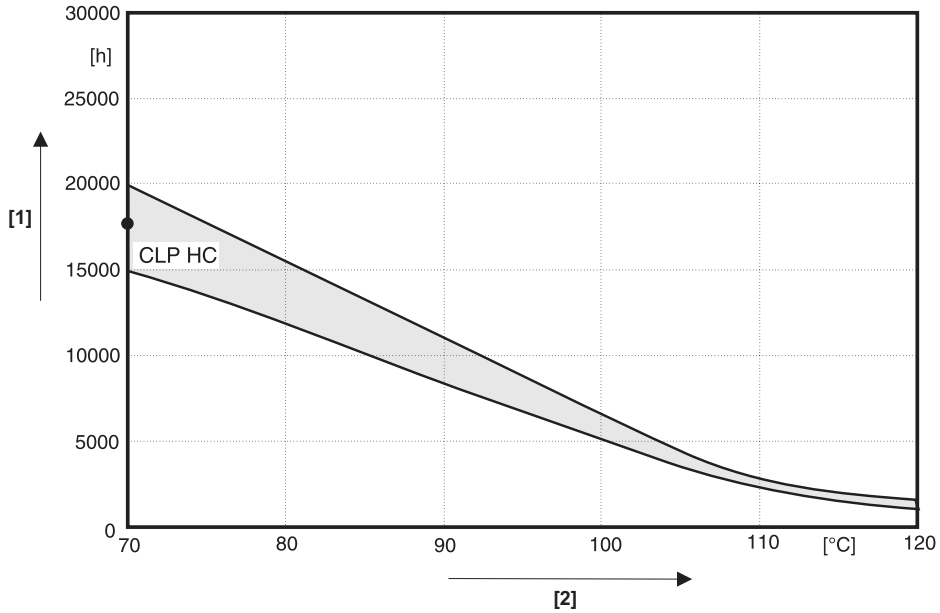
Mixing lubricants!

Do not mix the factory-filled lubricant with other lubricants.

6.2 Lubricant change intervals

BSF.. helical-bevel servo gear units can be used in ambient temperatures between –20 °C and +40 °C.

The following table lists the lubricant change intervals for the above temperature range.



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[1] Operating hours

[2] Sustained oil bath temperature

- Average value per oil type at 70 °C

See chapter 8 for more information on lubricants.

6.2.1 Fill quantities dependent on mounting position

BSF.. helical-bevel servo gear units	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
BSF202	0.15	0.25	0.25	0.30	0.25	0.25
BSF302	0.25	0.50	0.50	0.55	0.35	0.35
BSF402	0.45	0.80	0.80	1.05	0.65	0.65
BSF502	1.00	1.80	1.80	2.50	1.50	1.50
BSF602	1.60	2.50	2.80	4.10	2.00	2.60
BSF802	3.30	5.30	5.70	7.90	4.50	4.50

6.2.2 Fill quantity tolerances

Fill quantity in liters[l]	Tolerance
Up to 1 l	0.01 l
> 1 l	1% of the fill quantity

7 Malfunctions

7.1 Customer service

Please have the following information to hand if you require the assistance of our customer service:

- Nameplate data (complete)
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause

7.2 Faults and troubleshooting

Fault	Possible cause	Remedy
Unusual, irregular running noise	• Meshing / grinding noise: Bearing damage • Knocking noise: Irregularity in the gearing • Controller setting	• Contact customer service • Check inverter parameters
Oil leaking	• Defect oil seal or pseudo-leakage[1)]	• Contact customer service
Lubricant leaks from adapter	• Defect oil seal or pseudo-leakage[1)]	• Contact customer service
Difference between surface temperature and ambient temperature >55 K	• Restricted air supply • Speed/torque is too high	• Ensure air supply is unrestricted and / or contact customer service • Check the configuration and / or contact customer service

1) A temporary leakage caused by too much grease between the sealing lip and protective lip. The superfluous grease appears as a pseudo-leakage.

7.3 Send in for repair

Please contact the SEW-EURODRIVE service if a malfunction cannot be rectified.

Please provide the following information when sending the drive in for repair:

- Serial number (→ nameplate)
- Unit designation
- Digits of the service code
- Brief description of the application
- Connected motor (motor type, motor voltage, ⅄ or Δ circuit, rated speed)
- Nature of the error
- Accompanying circumstances
- Your own presumptions as to what has happened
- Any unusual events preceding the problem, etc.

8 Lubricants

8.1 General information

Unless a special arrangement is made, SEW-EURODRIVE supplies the gear units with a lubricant fill adapted for the specific mounting position. The decisive factor is the mounting position (M1...M6) specified when ordering the drive. The standard synthetic lubricant has a service life of approximately 5 years under normal operating conditions. When subject to increased stress, such as higher temperatures, the oil must be changed according to the lubrication intervals specified on page 42 .

SEW-EURODRIVE fills the gear units with the amount of oil specified for the specific mounting positions. If the mounting position is changed, the amount of oil must be adapted as required. Consequently, a mounting position may only be changed after consultation with SEW-EURODRIVE, otherwise your right to claim under warranty no longer applies.

- The BSF.. helical-bevel gear units from SEW-EURODRIVE are supplied exclusively with synthetic lubricants.

See section 6.2 for information on the lubricant change intervals.

The following lubricant table shows the permitted lubricants for BSF.. helical-bevel servo gear units from SEW-EURODRIVE.

8.2 Lubricant table for gear unit oil

BSF..	Ambient temperature ° C -20 0 +20 +40 +60	API class	ISO	Oil	Anti-friction bearing grease
	–20 +40	GL5	VG ~ 100	Mobillube SHC 75W-90 LS	Mobiltemp 100

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8.3 Lubricant table for the food industry

BSF..	Ambient temperature ° C -20 0 +20 +40 +60	ISO	Oil	Anti-friction bearing grease
	–20 +40	VG 460	Klübersynth UH1 6-460	Aral Eural Grease EP2

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9 Mounting Positions

9.1 General information on mounting positions

In the case of helical-bevel servo gear units, SEW-EURODRIVE distinguishes between mounting positions M1 to M6. The following figure shows the spatial orientation of the gear unit in mounting positions M1 to M6 with the output end A.

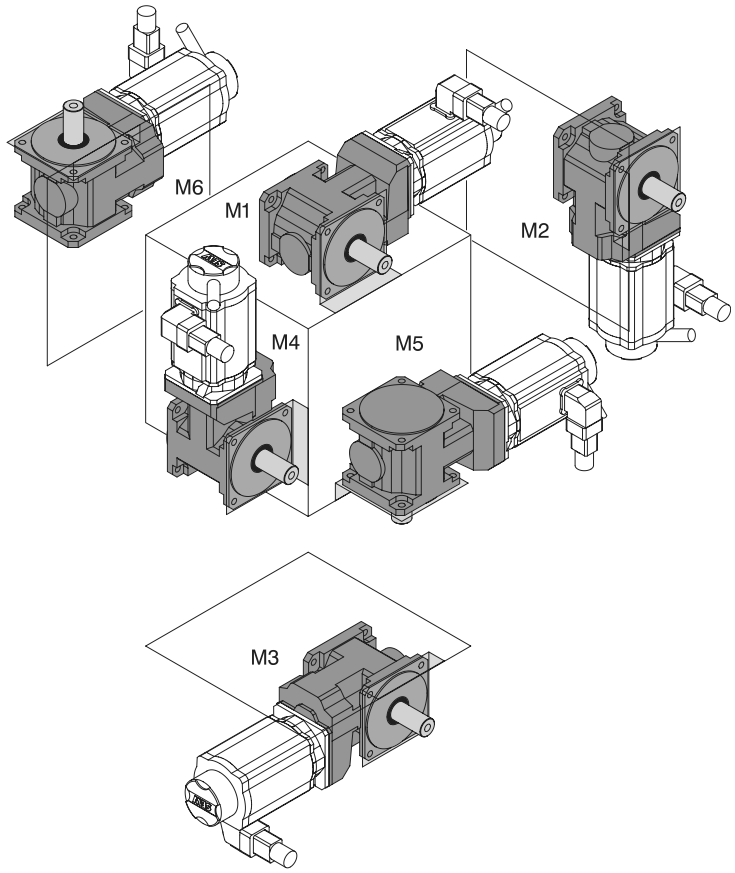

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Figure 18: Depiction of mounting positions M1 to M6 for the BSF.. helical-bevel servo gear units

Note the following information regarding display of shafts in the mounting position sheets:

- **For gear units with solid shaft:** The displayed shaft is always on the A end.
- **For shaft mounted gear units:** The shaft with dashed lines represents the customer shaft. The output end is always shown on the A end.

Position of A and B ends of output shafts

When installing the gear unit via one of the output flanges, the gear unit must be attached to the shaft output side via the B5 output flange.

Gear unit type	Position		Mounting
	of the output shaft	of the shrink disc	
BSF.. / BSKF.. / BSBF	A end	--	Mounting via B5 flange on the A end
	B end	--	Mounting via B5 flange on the B end
BSHF..	--	B end	Mounting via B5 flange on the A end
	--	A end	Mounting via B5 flange on the B end
BSHF.. / I	--	A end	Mounting via B5 flange on the A end
	--	B end	Mounting via B5 flange on the B end

For BSF.. helical-bevel servo gear units, the position of the output shaft A or B must always be specified.

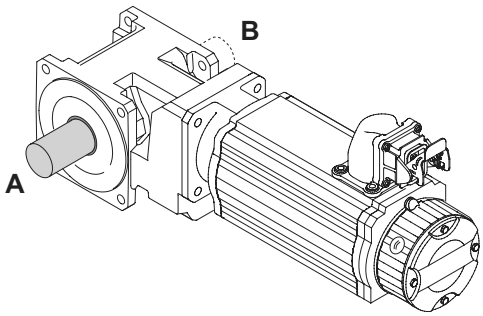

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Figure 19: Position of the output shaft of BSF.. helical-bevel servo gear units

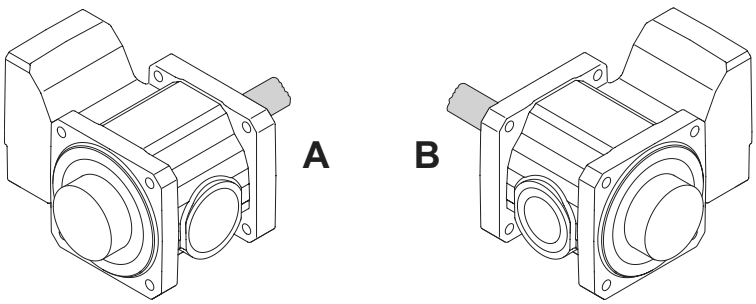

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Figure 20: Position of output shaft and output flange for BSHF.. helical-bevel servo gear units

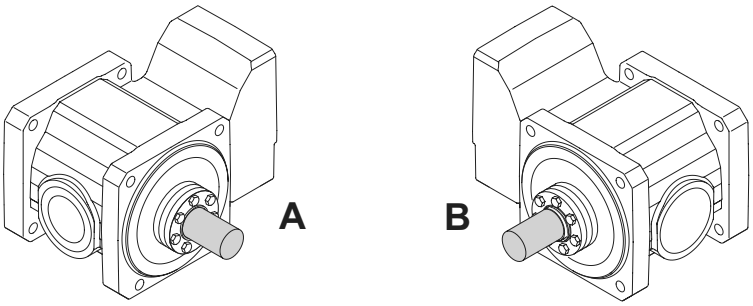

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Figure 21: Position of output shaft and output flange for BSHF../I helical-bevel servo gear units

9.1.1 Symbols used in the mounting position sheets

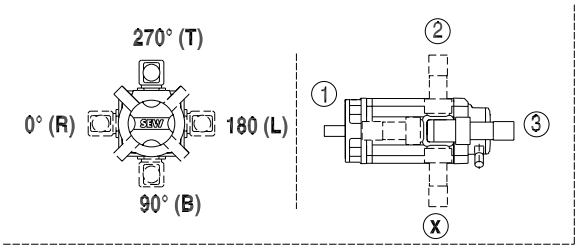
The following table shows the symbols used in the mounting position sheets and what they mean:

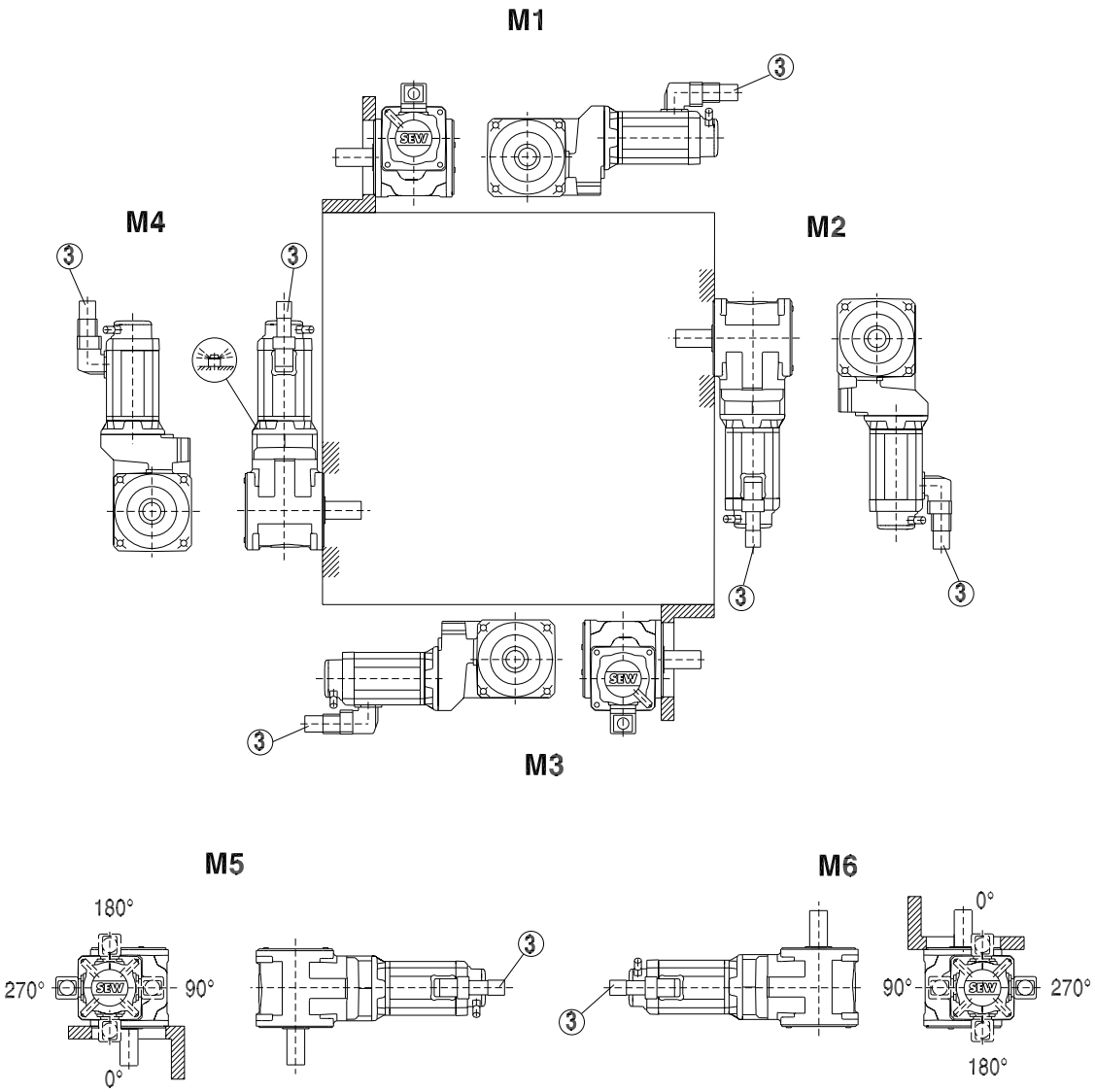
Symbol	Meaning
	Breather valve
3	"Standard" cable entry position

9.2 Mounting positions for helical-bevel servo gearmotors

9.2.1 BSF202-802

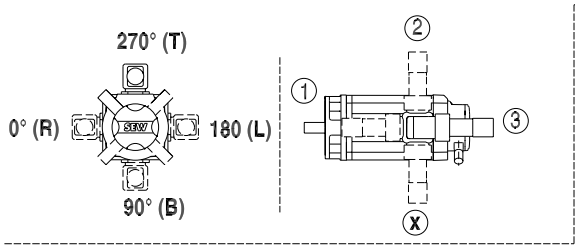
56 037 00 03





3 → page 48

9.2.2 BSBF202-802



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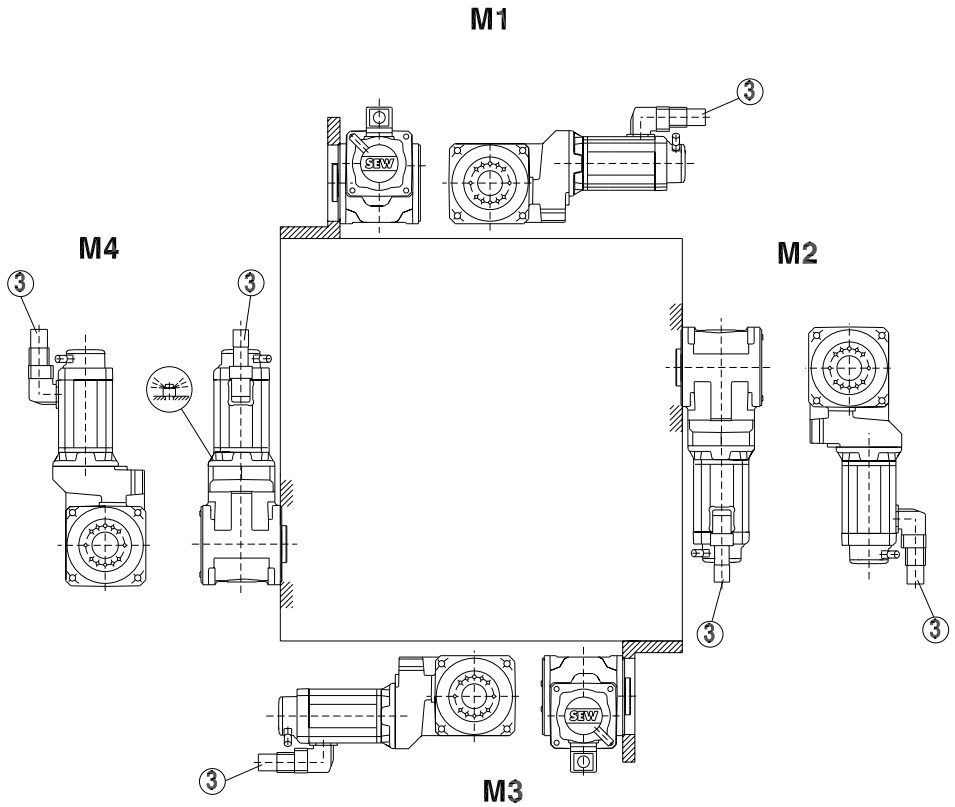
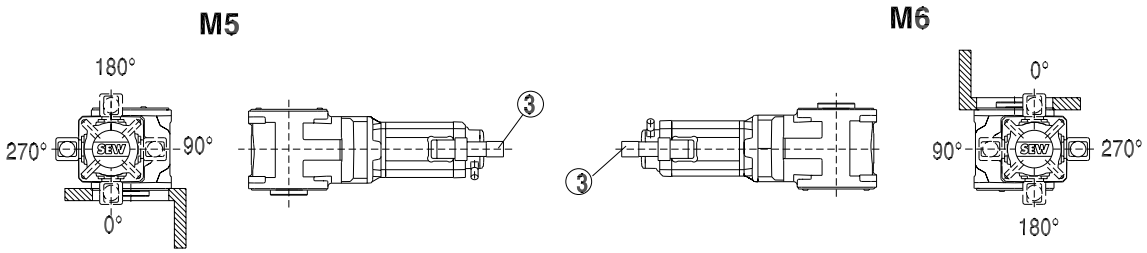
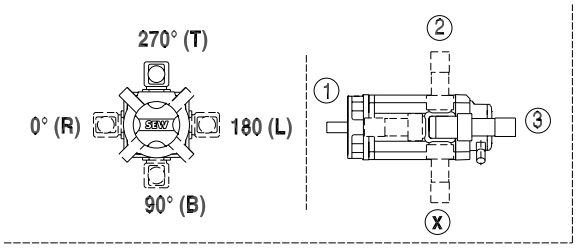




3 → page 48

9.2.3 BSHF202-802



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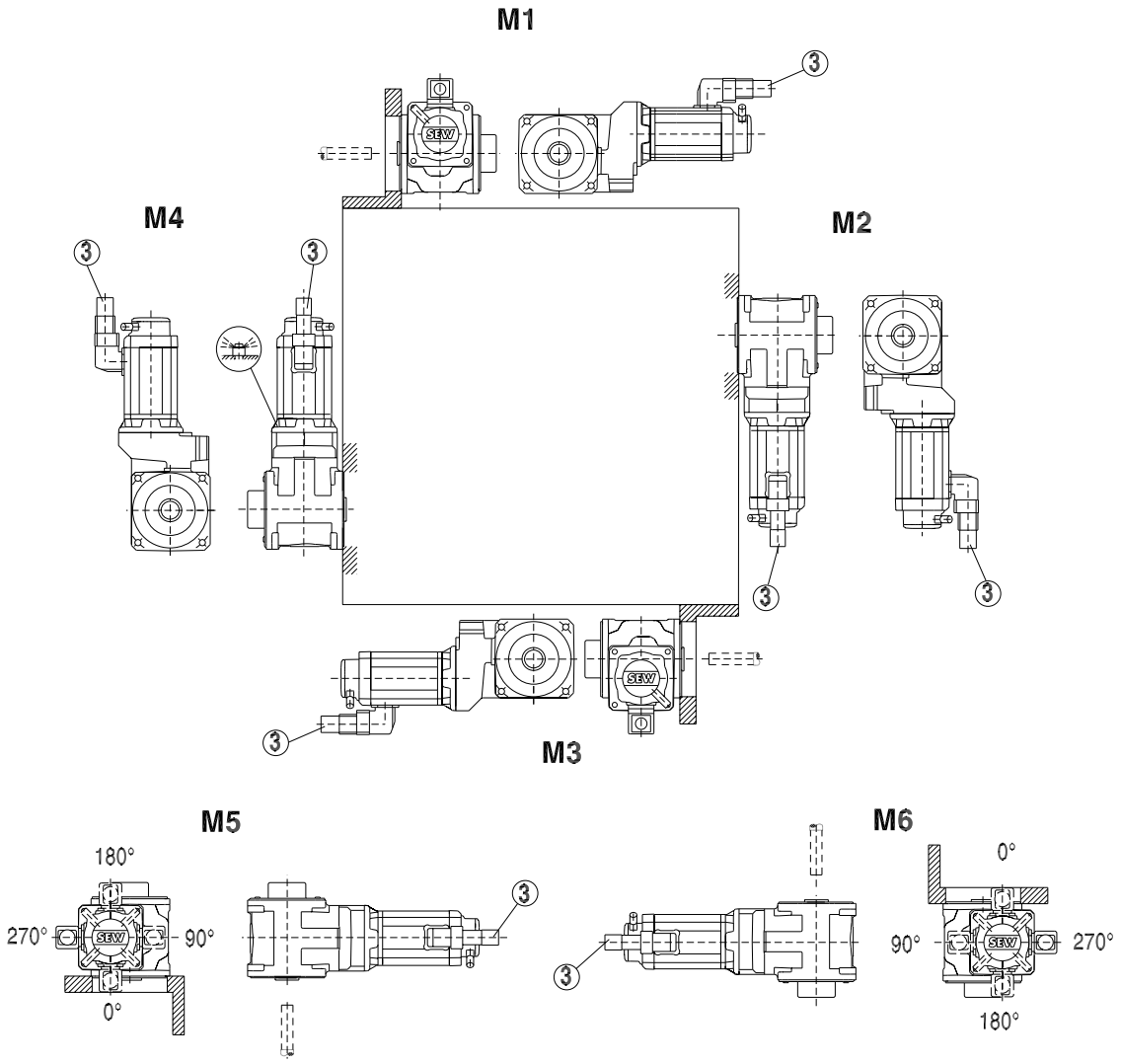
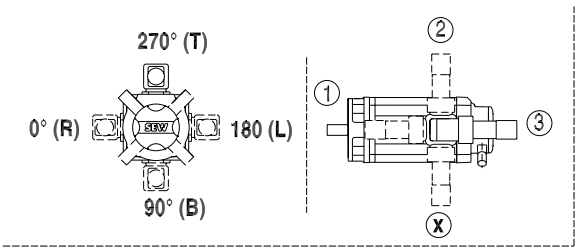


3 → page 48

9.2.4 BSHF202-802 /I



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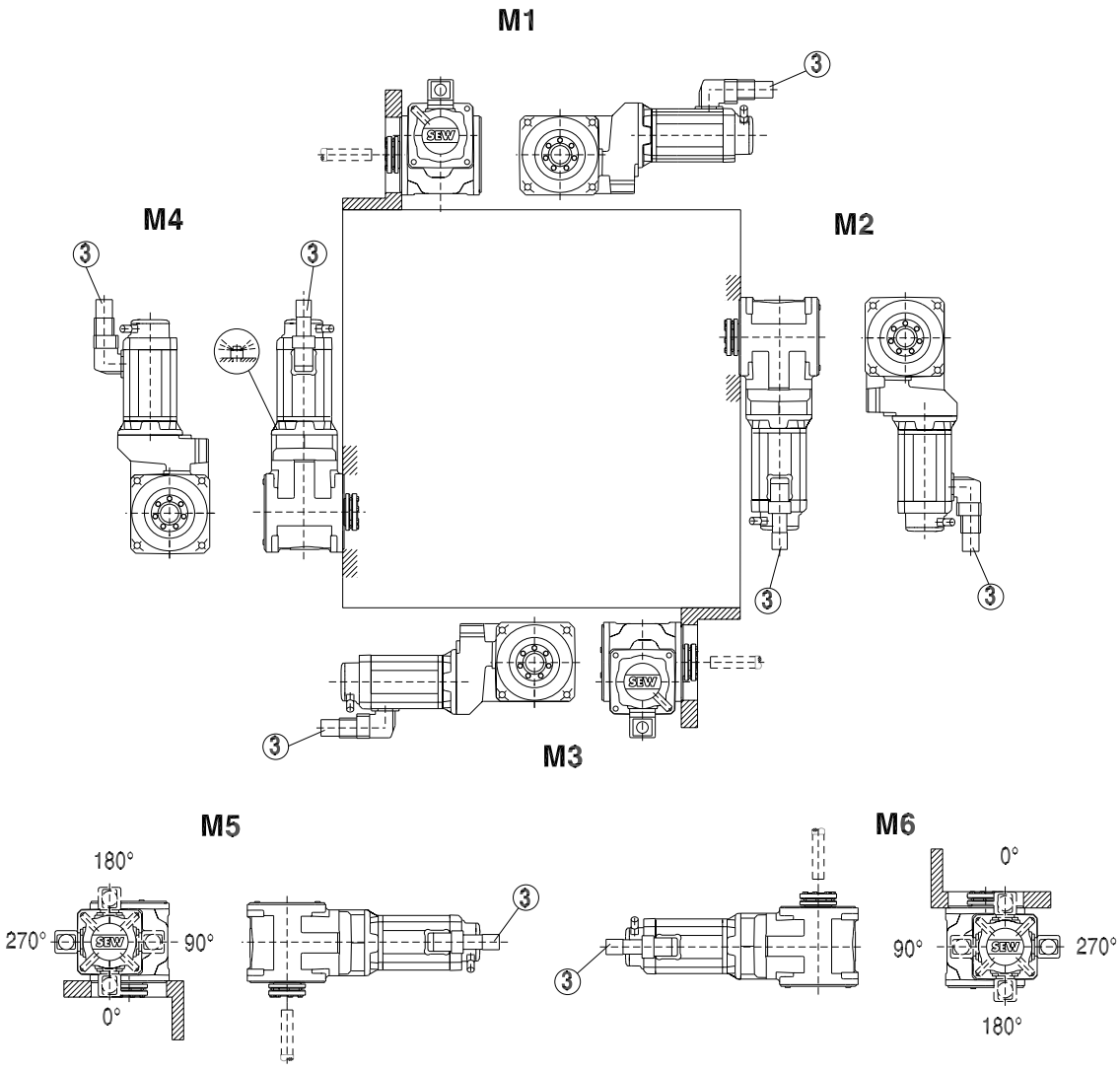
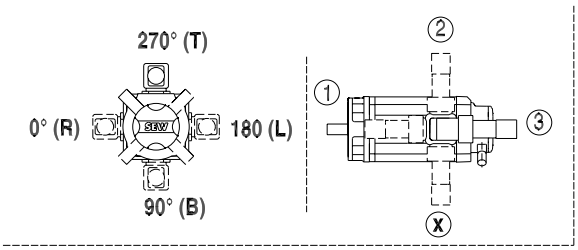


3 → page 48

9.2.5 BSHF202-802 /T



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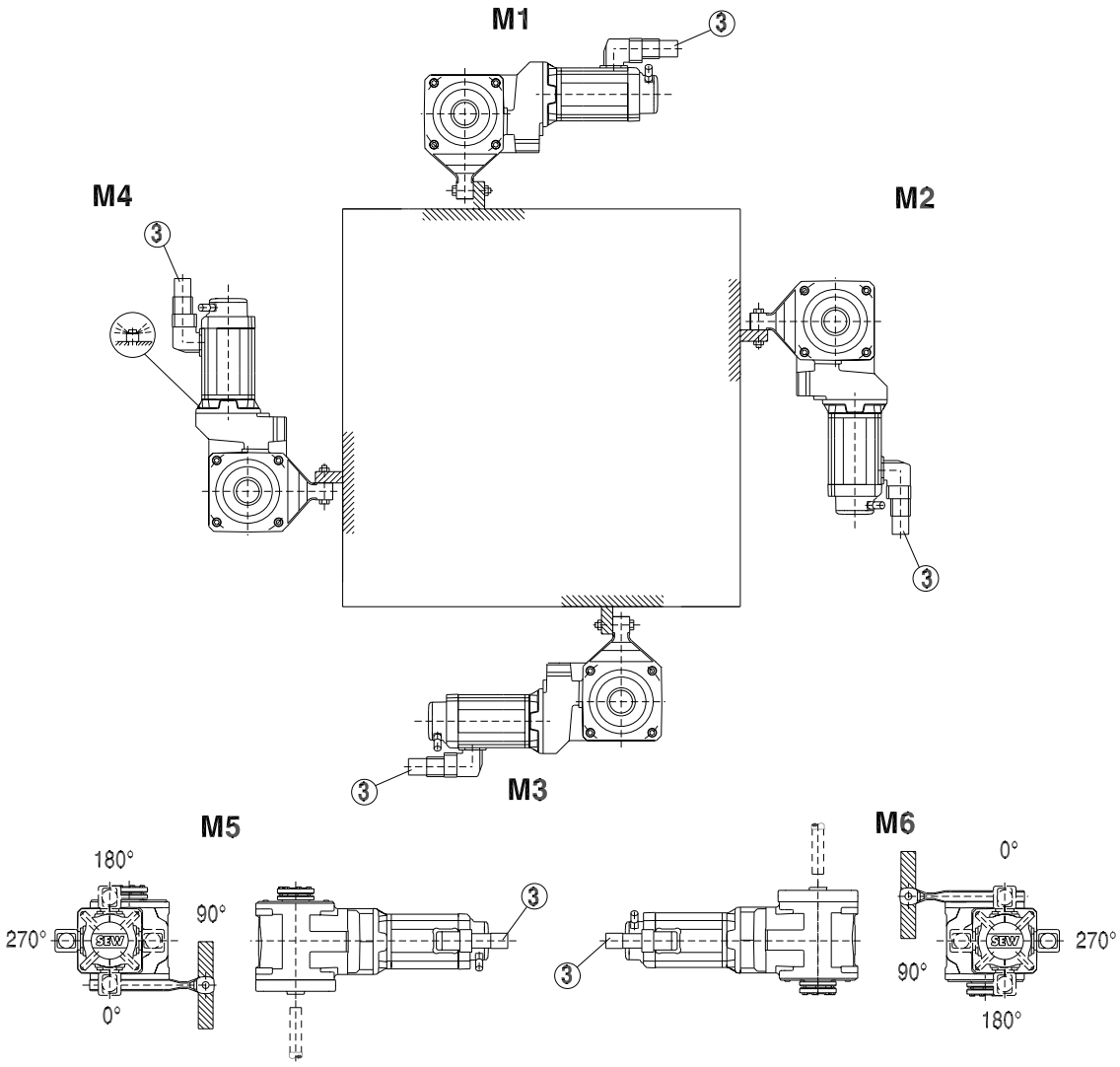
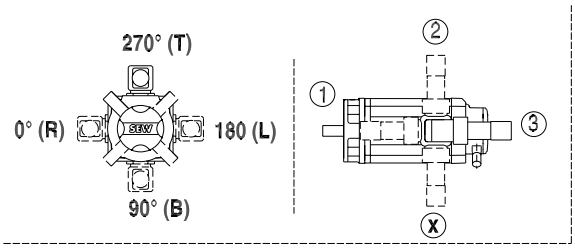


3 → page 48

9.2.6 BSF202-802 B



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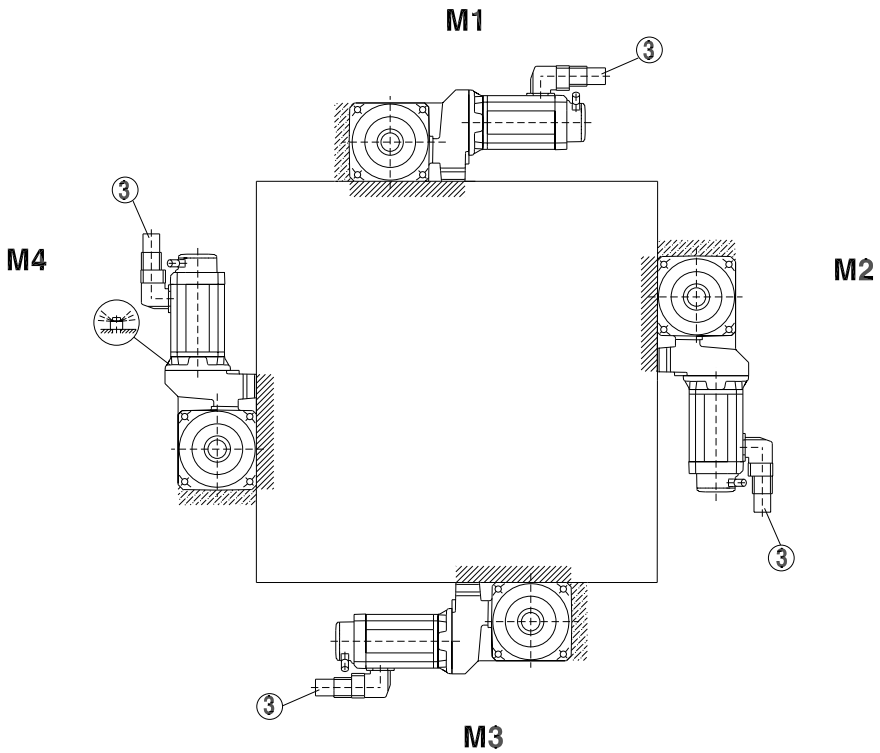
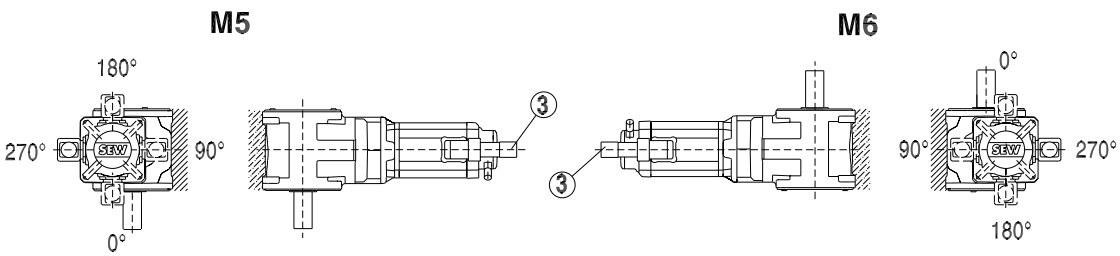
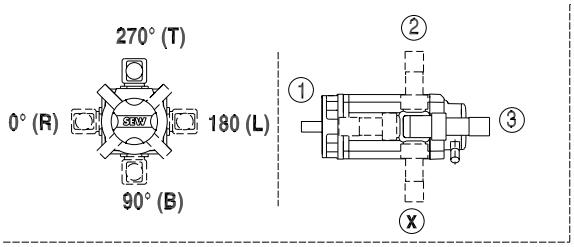




3 → page 48

9.2.7 BSBF202-802 B



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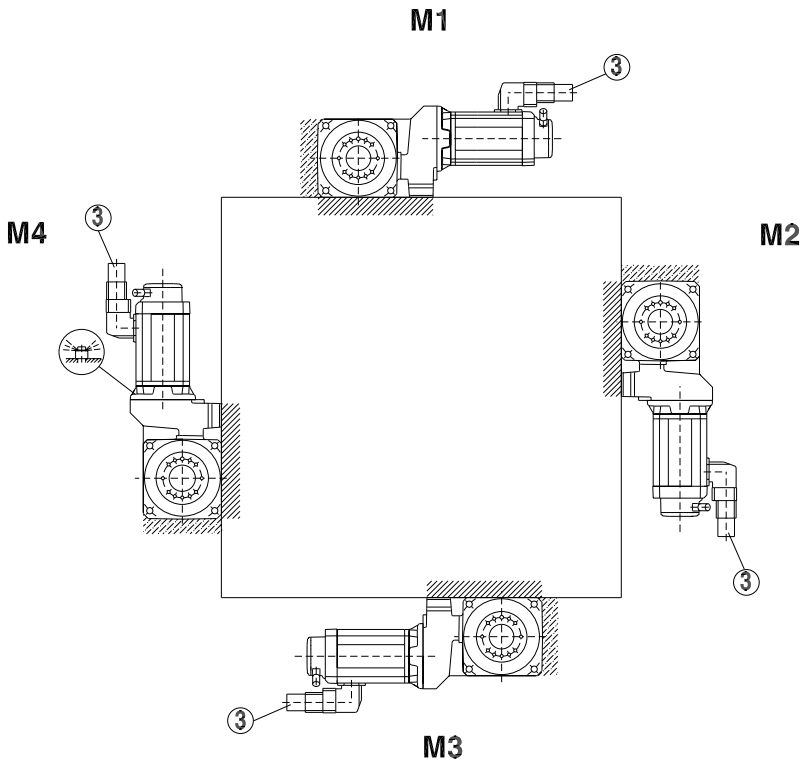
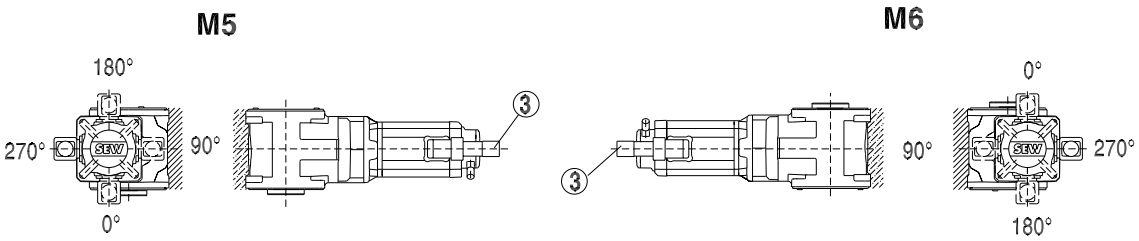
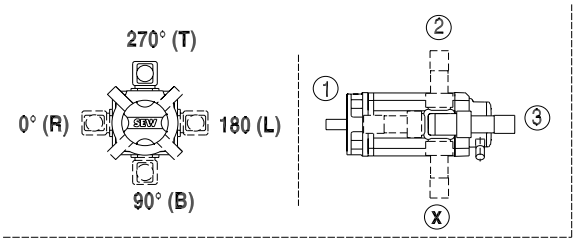


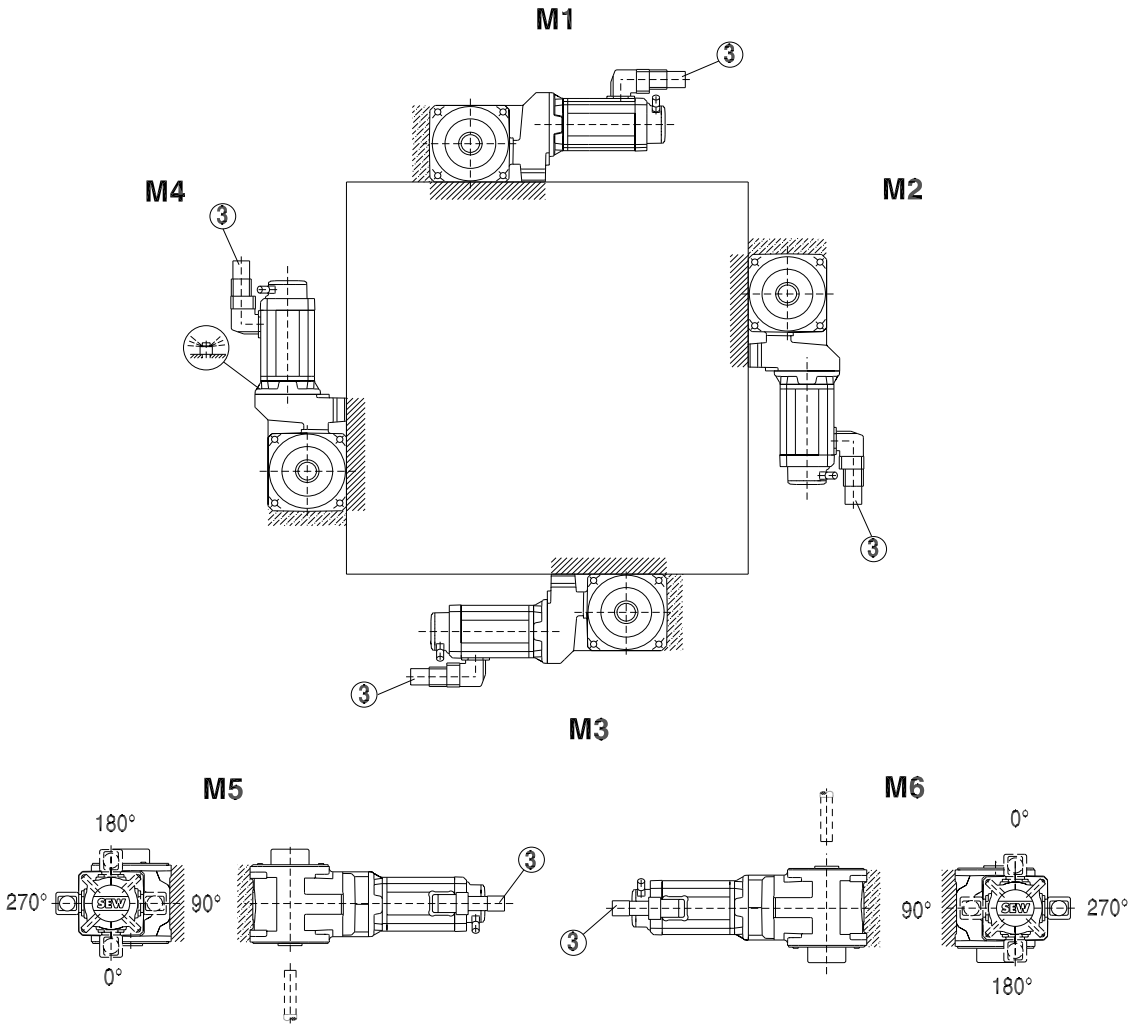


3 → page 48

9.2.8 BSHF202-802 B

56 057 00 03





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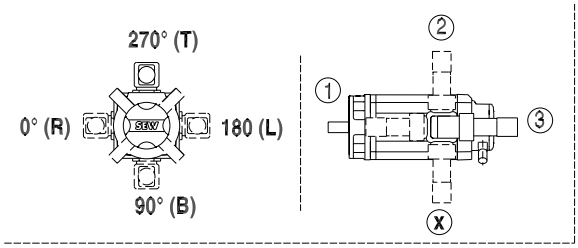
9.2.9 BSHF202-802 B /I



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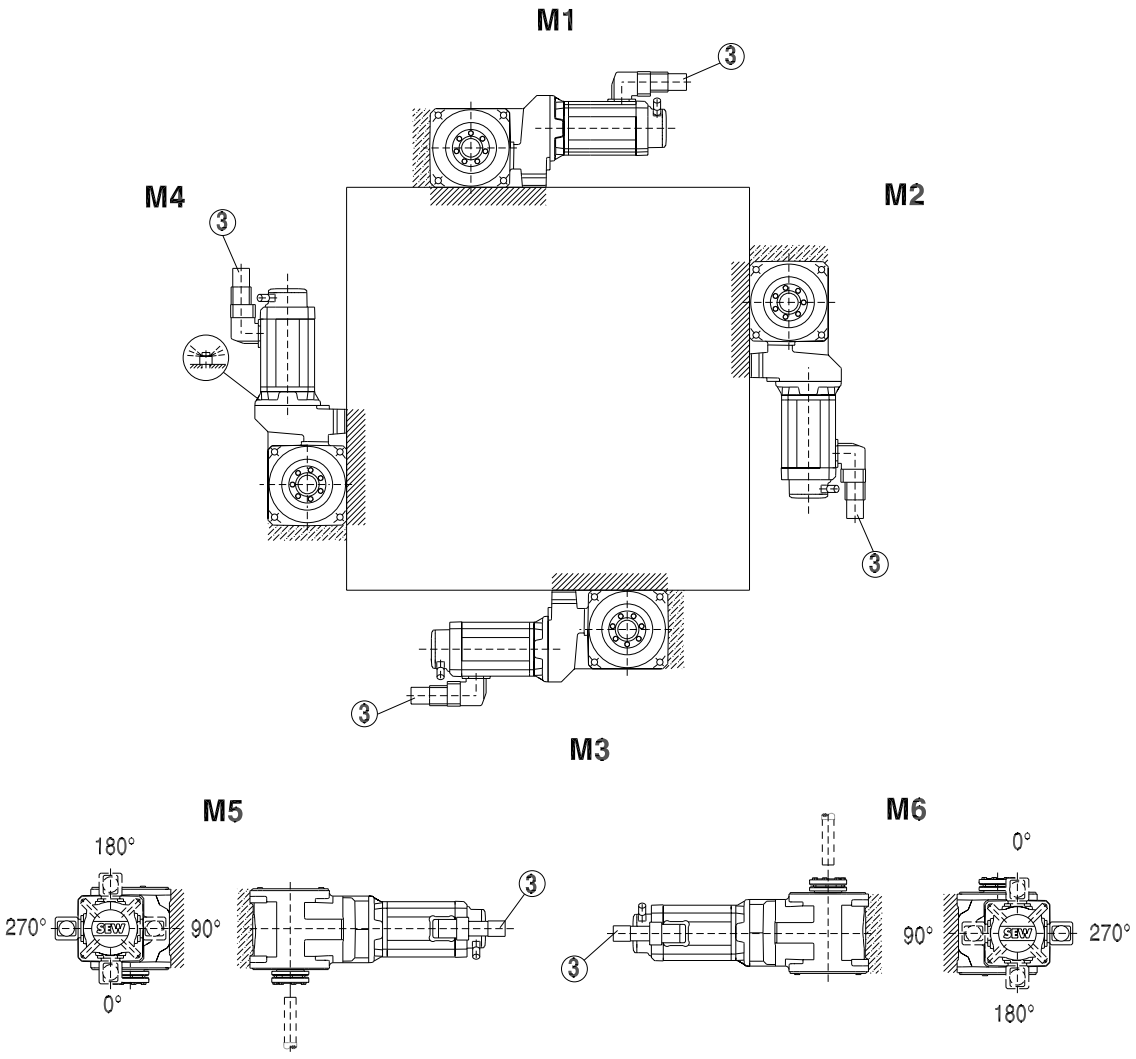

3 → page 48

10 Appendix

10.1 Appendix: List of abbreviations

Abbreviation	Definition/ meaning
BSF..	Helical-bevel servo gear unit **[B**evel **S**ervo **F**lange]
DIN	**D**eutsches **I**nstitut für **N**ormung e.V. (German institute for standardization)
EN	**E**uropäische **N**orm (European standard)
ISO	**I**nternational **O**rganization for **S**tandardization • The ISO creates ISO standards that should be adopted unrevised by the member states.
SW	**S**chlüssel**w**eite (Wrench size)

11 Index

A

Angular misalignment 29
Axial misalignment 29

B

Breather value, activate 24

C

Centering ring
Inner 27
Outer 27
Change intervals, lubricant 42
Controller setting 43
Customer service 43

D

Design
Adapter 19
BSBF.. helical-bevel servo gear units 18
BSF.. and BSKF.. helical-bevel servo gear units 17
BSF.. und BSKF.. helical-bevel servo gear units 17
Disassembly 38

E

EBH.. adapter 34
Explanation of symbols 7

F

Faults 43
Flange block 27
Foot mounting 22
Front-end mounting 23

G

Gear unit design 17
Gear unit painting 24
Gear units, installation 21

I

Important notes 5
Inner centering ring 27
Inspection 41
Installation
Couplings 29
Gear units 21
Sequence 35
Installation in the machine 22
Installation notes 28
Installation sequence 35
Installation, prerequisites 20
Installing torque arms 37
Inverter 43

L

Liability for defects 5
List of abbreviations 58
Lubricant
Change intervals 42
Fill quantities 42
Lubricant table for gear unit oil 45
Lubricants 45

M

Machine, installing the gear unit 22
Maintenance 41
Malfunctions 43
Malfunctions, operation 43
Maximum weight, motors 36
Measuring the oil temperature 40
Measuring the surface temperature 39
Mechanical installation 20
Monitoring device 39
Motor mounting with EPH.. adapter 34
Motor, removal 38
Mounting
Output elements onto solid shafts 25
With key 25
Without key 26
Mounting device 20

N

Nameplate 14, 16
Notes
Safety 8
Notes, installation 28

O

Options 11
Outer centering ring 27
Output shaft, position 47
Overhung loads 27

P

Prerequisites for installation 20
Protection device 39
Pseudo-leakage 43
Putting into storage 9

R

Recycling 6
Removing the motor 38
Repair 44

S

Safety instructions 7
Safety notes 8
Scrap metal
Aluminum 6
Steel 6
Serial number 44
Shipping 9
Startup 39

T
Tools 20
Torque wrench 20
Touch guard 29
Troubleshooting 43
Types 11

U
Unit designation 13, 15

W
Warning instructions 7
Waste disposal 6
Waste oil 6

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	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 sc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 sc-west@sew-eurodrive.de
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357
	Additional addresses for service in Germany provided on request!		

France			
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Assembly **Sales** **Service**	**Bordeaux**	SEW-USOCOME Parc d'activités de Magellan 62, avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
	Paris	SEW-USOCOME Zone industrielle 2, rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
	Additional addresses for service in France provided on request!		

Algeria			
Sales	**Alger**	Réducom 16, rue des Frères Zaghnoun Bellevue El-Harrach 16200 Alger	Tel. +213 21 8222-84 Fax +213 21 8222-84

Argentina			
Assembly **Sales** **Service**	**Buenos Aires**	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 sewar@sew-eurodrive.com.ar

Australia			
Assembly **Sales** **Service**	**Melbourne**	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
	Townsville	SEW-EURODRIVE PTY. LTD. 12 Leyland Street Garbutt, QLD 4814	Tel. +61 7 4779 4333 Fax +61 7 4779 5333 enquires@sew-eurodrive.com.au

Austria			
Assembly **Sales** **Service**	**Wien**	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://sew-eurodrive.at sew@sew-eurodrive.at

Belgium			
Assembly **Sales** **Service**	**Brüssel**	SEW Caron-Vector S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be

Brazil			
Production **Sales** **Service**	**Sao Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 50 Caixa Postal: 201-07111-970 Guarulhos/SP - Cep.: 07251-250	Tel. +55 11 6489-9133 Fax +55 11 6480-3328 http://www.sew.com.br sew@sew.com.br
	Additional addresses for service in Brazil provided on request!		

Bulgaria			
Sales	**Sofia**	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@fastbg.net

Cameroon			
Sales	**Douala**	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 4322-99 Fax +237 4277-03

Canada			
Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, Ontario L6T3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.reynolds@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. 7188 Honeyman Street Delta. B.C. V4G 1 E2	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Street LaSalle, Quebec H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
	Additional addresses for service in Canada provided on request!		

Chile			
Assembly **Sales** **Service**	**Santiago de Chile**	SEW-EURODRIVE CHILE LTDA. Las Encinas 1295 Parque Industrial Valle Grande LAMPA RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 75770-00 Fax +56 2 75770-01 www.sew-eurodrive.cl ventas@sew-eurodrive.cl

China			
Production **Assembly** **Sales** **Service**	**Tianjin**	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25322611 gm-tianjin@sew-eurodrive.cn http://www.sew-eurodrive.com.cn
Assembly **Sales** **Service**	**Suzhou**	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021 P. R. China	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew.com.cn
	Additional addresses for service in China provided on request!		

Colombia			
Assembly **Sales** **Service**	**Bogotá**	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sewcol@sew-eurodrive.com.co

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. PIT Erdödy 4 II HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@net.hr

Czech Republic			
Sales	**Praha**	SEW-EURODRIVE CZ S.R.O. Business Centrum Praha Luzna 591 CZ-16000 Praha 6 - Vokovice	Tel. +420 220121234 Fax +420 220121237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz

Denmark			
Assembly **Sales** **Service**	**Kopenhagen**	SEW-EURODRIVEA/S Geminivej 28-30, P.O. Box 100 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Mustamäe tee 24 EE-10620Tallin	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 sew@sew.fi http://www.sew-eurodrive.fi

Gabon			
Sales	**Libreville**	Electro-Services B.P. 1889 Libreville	Tel. +241 7340-11 Fax +241 7340-12

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 GB-Normanton, West- Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk

Greece			
Sales **Service**	**Athen**	Christ. Boznos & Son S.A. 12, Mavromichali Street P.O. Box 80136, GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr

Hong Kong			
Assembly **Sales** **Service**	**Hong Kong**	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 2 7960477 + 79604654 Fax +852 2 7959129 sew@sewhk.com

Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 office@sew-eurodrive.hu

India			
Assembly **Sales** **Service**	**Baroda**	SEW-EURODRIVE India Pvt. Ltd. Plot No. 4, Gidc Por Ramangamdi • Baroda - 391 243 Gujarat	Tel. +91 265 2831086 Fax +91 265 2831087 http://www.seweurodriveindia.com mdoffice@seweurodriveindia.com
Technical Offices	**Bangalore**	SEW-EURODRIVE India Private Limited 308, Prestige Centre Point 7, Edward Road Bangalore	Tel. +91 80 22266565 Fax +91 80 22266569 salesbang@seweurodriveinindia.com

Ireland			
Sales **Service**	**Dublin**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458

Israel			
Sales	**Tel-Aviv**	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 lirazhandasa@barak-online.net

Italy			
Assembly **Sales** **Service**	**Milano**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it

Ivory Coast			
Sales	**Abidjan**	SICA Ste industrielle et commerciale pour l'Afrique 165, Bld de Marseille B.P. 2323, Abidjan 08	Tel. +225 2579-44 Fax +225 2584-36

Japan			
Assembly **Sales** **Service**	**Toyoda-cho**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 sewjapan@sew-eurodrive.co.jp

Korea			
Assembly **Sales** **Service**	**Ansan-City**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate Unit 1048-4, Shingil-Dong Ansan 425-120	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master@sew-korea.co.kr

Latvia			
Sales	**Riga**	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 7139253 Fax +371 7139386 http://www.alas-kuul.com info@alas-kuul.com

Lebanon			
Sales	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 4947-86 +961 1 4982-72 +961 3 2745-39 Fax +961 1 4949-71 gacar@beirut.com

Lithuania			
Sales	**Alytus**	UAB Irseva Naujoji 19 LT-62175 Alytus	Tel. +370 315 79204 Fax +370 315 56175 info@irseva.lt http://www.sew-eurodrive.lt

Luxembourg			
Assembly **Sales** **Service**	**Brüssel**	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be

Malaysia			
Assembly **Sales** **Service**	**Johore**	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my

Mexico			
Assembly **Sales** **Service**	**Queretaro**	SEW-EURODRIVE MEXIKO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrail Queretaro C.P. 76220 Queretaro, Mexico	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx

Morocco			
Sales	**Casablanca**	Afit 5, rue Emir Abdelkader MA 20300 Casablanca	Tel. +212 22618372 Fax +212 22618351 richard.miekisiak@premium.net.ma

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu

New Zealand			
Assembly **Sales** **Service**	**Auckland**	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 241-020 Fax +47 69 241-040 http://www.sew-eurodrive.no sew@sew-eurodrive.no

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Lodz	Tel. +48 42 67710-90 Fax +48 42 67710-99 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucuresti**	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Assembly **Sales** **Service**	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 36 195220 St. Petersburg Russia	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

Senegal			
Sales	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 849 47-70 Fax +221 849 47-71 senemeca@sentoo.sn

Serbia and Montenegro			
Sales	**Beograd**	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor SCG-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 dipar@yubc.net

Singapore			
Assembly **Sales** **Service**	**Singapore**	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com

Slovakia			
Sales	**Bratislava**	SEW-Eurodrive SK s.r.o. Rybnicna 40 SK-83107 Bratislava	Tel. +421 2 49595201 Fax +421 2 49595200 http://www.sew.sk sew@sew-eurodrive.sk
	Zilina	SEW-Eurodrive SK s.r.o. ul. Vojtecha Spanyola 33 SK-010 01 Zilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-97411 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

South Africa			
Assembly **Sales** **Service**	**Johannesburg**	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za dross@sew.co.za

South Africa			
	Capetown	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 dswanepoel@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 dtait@sew.co.za

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 9 4431 84-70 Fax +34 9 4431 84-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442-00 Fax +46 36 3442-80 http://www.sew-eurodrive.se info@sew-eurodrive.se

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch

Thailand			
Assembly **Sales** **Service**	**Chon Buri**	SEW-EURODRIVE (Thailand) Ltd. Bangpakong Industrial Park 2 700/456, Moo.7, Tambol Donhuaroh Muang District Chon Buri 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com

Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service 7, rue Ibn EI Heithem Z.I. SMMT 2014 Mégrine Erriadh	Tel. +216 1 4340-64 + 1 4320-29 Fax +216 1 4329-76 tms@tms.com.tn

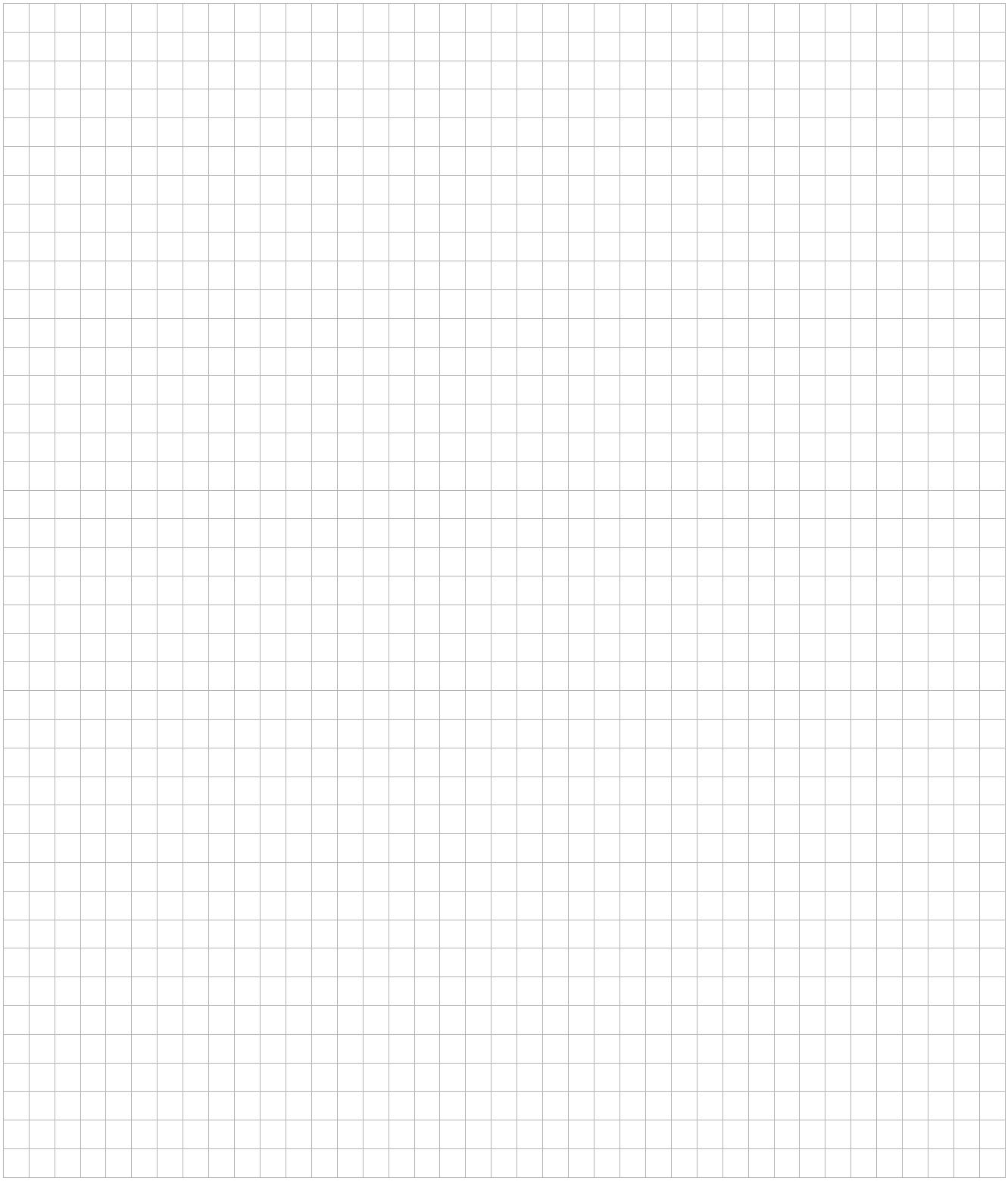
Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419163 / 164 3838014/15 Fax +90 216 3055867 sew@sew-eurodrive.com.tr

Ukraine			
Sales **Service**	**Dnepropetrovsk**	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua

USA			
Production **Assembly** **Sales** **Service**	**Greenville**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manuf. +1 864 439-9948 Fax Ass. +1 864 439-0566 Telex 805 550 http://www.seweurodrive.com cslyman@seweurodrive.com

USA			
Assembly **Sales** **Service**	**San Francisco**	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 510 487-3560 Fax +1 510 487-6381 cshayward@seweurodrive.com
	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Additional addresses for service in the USA provided on request!		

Venezuela			
Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve sewventas@cantv.net sewfinanzas@cantv.net



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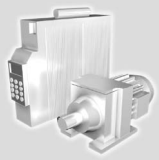

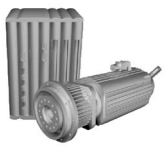

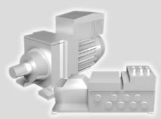

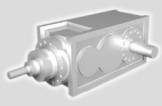

SEW EURODRIVE

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